

CALIFORNIA

FOLLOW-UP AND SUPPLEMENTAL REVIEW



**State Review of Oil and Natural Gas
Environmental Regulations, Inc.**

December, 2002

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INTRODUCTION

This report includes a follow-up review of the progress made by the several California state agencies including the Division of Oil, Gas and Geothermal Resources (DOGGR), the State Water Resources Control Board (SWRCB), the Division of Toxic Substances Control (DTSC), the Regional Water Quality Control Boards of Regions 3 and 5 (RWQCBs), the California Air Resources Board (CARB), and the Integrated Waste Management Board (IWMB) since the original assessment performed pursuant to the 1990 *EPA/IOCC Study of State Regulation of Oil and Gas Exploration and Production Waste* (the "IOGCC Guidelines"). That assessment, known as the California State Review, was published in May 1993, and contained specific findings and recommendations for action based on the IOGCC Guidelines.

Since the initial review, the IOGCC Guidelines were updated and revised by the Interstate Oil and Gas Compact Commission (the "IOGCC") in 1994. In 1999, administration of the state review program devolved to State Review of Oil and Natural Gas Environmental Regulations, Inc. ("STRONGER"), a non-profit, multi-stakeholder organization. STRONGER again revised, expanded and updated the Guidelines, which were accepted by the IOGCC, and published in June 2000 as the *Guidelines for the Review of State Oil and Natural Gas Environmental Regulatory Programs* (the "2000 Guidelines"). This report is also a review of aspects of the agencies' activities not covered by the IOGCC Guidelines, but which are addressed in the 2000 Guidelines.

In addition, this report contains a follow-up review of the California Underground Injection Control (UIC) program. The UIC program is designed to protect Underground Sources of Drinking Water (USDWs) through the regulation of Class II injection wells. An initial Peer Review of the California UIC Program was conducted in 1988, resulting in a report by the Underground Injection Practices Council (UIPC) dated 1989. The UIPC is now the Ground Water Protection Council (GWPC). The UIPC Peer Review contained a number of recommendations to the California UIC program. This follow-up UIC review focuses on those recommendations.

In April, 2002, a thirteen-person team appointed by STRONGER and GWPC conducted a follow-up and supplemental review to evaluate progress made in the California program since the initial review, and to evaluate the adequacy of the program compared to the 2000 Guidelines. In addition, the team conducted a follow-up UIC review of the California UIC program. The thirteen-person team consisted of six members and seven observers. Don Garvin of Trout Unlimited; Diane Conn of Citizens for the Goleta Valley; Lori Wrotenbery of the New Mexico Oil Conservation Division; Carroll Wascom of the Louisiana Office of Conservation; Catherine Reheis-Boyd of Western States Petroleum Association; and William Brommelsiek of ChevronTexaco served as team members. Ben Grunewald of the Groundwater Protection Council; George Robin of the U. S. EPA Water Management Division; Nancy Johnson of the U.S. Department of Energy; Mark Carl representing the IOGCC; William Bryson representing the Groundwater Protection Council; James Erb of the STRONGER Board and the Pennsylvania Bureau of Oil and Gas Management; and Jeff Prude of the Bureau of Land Management Bakersfield District participated as observers. Four team members, Lori Wrotenbery, Carroll Wascom, Cathy Reheis-Boyd, Bill Brommelsiek, and one observer, Jim Erb, served on the initial IOGCC review. One observer, Bill Bryson, served on the initial UIPC Peer Review team. Nancy Johnson served as the DOE observer to both the IOGCC and UIPC reviews.

The in-state portion of the follow-up review was conducted in Bakersfield, California at the offices of the DOGGR on April 21st through 25th, 2002. Mr. William Guerard and Mr. Michael Stettner of the DOGGR responded to questions from the team and observers. Other DOGGR staff participating included Hal Bopp, Steve Fields, Dave Mitchell and Ed Brannon. Other agencies' representatives who participated in the review included Peter Fuller, SWRCB; Claudia Nagy, DTSC; Shelton Gray, RWQCB Region 5; and Lou Blanck, RWQCB Region 3. Following the interviews and review of the

written materials and backup documentation provided by the state, the review team compiled this follow up review report.

The follow-up review of the California responses to the recommendations of the initial 1993 review, and the supplemental review of program aspects not covered by the IOGCC Guidelines, have been integrated under the section headings of the 2000 Guidelines in order to group like subject matter. Each report section is divided into follow-up review and supplemental review subsections. Those portions of the 2000 Guidelines that are new or changed since the 1993 review are re-printed to clarify the scope of the supplemental review. References to the “Guidelines” in the text of the report refer to provisions of the 2000 Guidelines rather than the IOGCC Guidelines.

The follow-up UIC review report is presented as section VII of this report.

PROGRAM OVERVIEW

Oil Production

California continues to rank fourth among the oil-producing states, behind Louisiana, Texas, and Alaska. In 2000, California's oil was produced from 207 fields at a rate of about 840,000 barrels a day.

During 2000, California's crude oil production decreased slightly from 1999. Production totaled 307.4 million barrels in 2000, compared with 311.5 million barrels in 1999. Although production in the state onshore and state offshore areas was about the same as 1999, production decreased in the federal offshore area. The state total includes 253.2 million barrels of oil produced from onshore fields and 54.2 million barrels from offshore fields.

Of the more than 174,000 known wells ever drilled in the State, there were 46,799 producing oil wells and 1,169 producing gas wells in 2000, an increase of 1,202 oil wells from 1999. The number of stripper wells in operation in 2000 was 22,244.

Enhanced Oil Recovery

In 2000, incremental oil production from all types of enhanced oil recovery (EOR) projects accounted for approximately 181.5 million barrels, or 59 percent of California's oil production. Steam stimulation was credited with approximately 135.7 million barrels, or 75 percent of all incremental oil production. Waterflooding accounted for approximately 43.8 million barrels, or 24 percent of the incremental production total. As of 2000, there were 23,934 EOR wells in the State.

Natural Gas Production

California's total net natural gas production increased from 376.4 billion cubic feet in 1999 to 379.0 billion cubic feet in 2000, continuing a trend that started in 1998. The 2000 total included 45.8 billion cubic feet from federal offshore fields.

Reserves

As of December 31, 2000, California's estimated recoverable (proven) oil reserves totaled 3.6 billion barrels. Proven gas reserves in the state were estimated at 5.0 trillion cubic feet.

Drilling Activity

The number of new oil, gas, service, and prospect (exploratory) wells drilled increased from 1,752 wells in 1999 to 2,666 wells in 2000. The number of wells completed increased from 1,379 wells in 1999 to 2,131 in 2000. The number of wells plugged and abandoned increased from 1,307 wells in 1999 to 1,935 in 2000.

Disposal Wells

As of 2000, there were 1,186 Class II disposal wells in the State.

Environmental Regulations

Since 1950, the exploration and production waste management program for the State of California has developed into a complex system of local and state controls. Aesthetics were the primary environmental concern until 1971, when the Division of Oil, Gas and Geothermal Resources (DOGGR) and the California Department of Fish and Game began a program to inventory and eliminate oilfield pits (sumps) that were hazardous or immediately dangerous to wildlife. Assembly Bill 2209, enacted in 1973, provided for a legally mandated, full-scale sump inspection and correction program. In 1975, DOGGR targeted hazardous and idle-deserted wells for plugging and abandonment under a program that was funded through DOGGR budget and drilling bonds. This program is on-going, as well.

Regulatory Jurisdictions and Authorities

A variety of state, regional, and local agencies regulate E&P waste management activities in California. The principal state and regional agencies with jurisdiction in this area are:

- DOGGR within the Department of Conservation (DOC);
- State Water Resources Control Board (SWRCB);
- Regional Water Quality Control Boards (RWQCBs) (nine regions);
- Department of Toxic Substances Control (DTSC);
- California Integrated Waste Management Board (IWMB); and
- California Air Resources Board (CARB).

SWRCB, DTSC, IWMB and CARB are all within the California Environmental Protection Agency (Cal-EPA).

See the May 1993 California State Review for more detailed discussion of the roles and responsibilities of the state and regional agencies.

Division of Oil, Gas, and Geothermal Resources

Led by the State Oil and Gas Supervisor, DOGGR is headquartered in Sacramento and has six oil and gas district offices. In general, DOGGR is responsible for the protection of life, health, property, and natural resources, and the conservation of oil, gas, and geothermal resources in California. DOGGR's E&P waste management jurisdiction covers only those wastes originating in oil and gas fields and the operations of Class II injection wells.

DOGGR's jurisdiction includes the drilling, operation, maintenance, and plugging and abandonment of oil, natural gas, and geothermal, and service wells; removal of unused tanks and facilities attendant to oil gas production; the management of pipelines within the oilfields; spill contingency planning; and, general lease maintenance. In addition, DOGGR's sump (pit) requirements apply to wildlife protection from production sumps and sumps associated with workover operations. However, air and water quality matters related to production sumps, land treatment operations, or other onsite units are largely the responsibilities of other agencies that are within Cal-EPA .

DOGGR is authorized to promulgate regulations governing E&P waste management practices within its jurisdiction. Those regulations are codified in Chapters 2 and 4 of Title 14 of the California Code of Regulations (CCR).

Since the initial review in 1993, DOGGR has made several significant changes to its programs. To address the growing number of idle wells, DOGGR implemented the idle-well management program in an effort to reduce the number of long-term idle wells by encouraging operators to reactivate or plug and abandon their idle wells. In addition, DOGGR has strengthened its requirements regarding well bonds and pipelines located in environmentally sensitive areas.

REVIEW HIGHLIGHTS

A characteristic of the California program for the management of E&P waste is that a number of state, and in some cases local, agencies have lead responsibility for different portions of the program. This presents coordination complexities that are not present in most E&P waste management programs. Some California waste management standards, notably the definition of hazardous wastes, are more stringent than required by the Guidelines. The Review team noted several aspects of the California E&P waste management and UIC programs that merit special recognition, and that may offer ideas for other state regulatory programs.

Public Participation and Outreach

The primary agencies involved in oil and gas E&P waste issues are actively involved in outreach and education programs for the regulated community and the public. The DOGGR, particularly, is to be commended for its efforts in supporting agency/industry/public oil and gas work groups, a bi-annual oil and gas conference, and development of the Department's data management system and web site. DOGGR has been especially proactive in conducting workshops among other jurisdictional agency staff members, local planning agencies and industry representatives to address emerging issues and coordinate the efforts of state and local jurisdictional entities.

Interagency Coordination

In light of the many agencies with jurisdictional responsibilities for management of E&P wastes, DOGGR has expended a great deal of effort to improve communications and coordinate activities among the involved agencies. Those efforts have borne fruit, particularly in coordination with the BLM on idle and orphaned wells, with CAL-EPA on UIC activities, with RWQCB Region 5, and with local agencies in planning and abandoned site remediation activities.

DOGGR also supports multi-agency working groups that address specific E&P issues. The Cal-E&P Regulatory Reform Task Force formed a Roadmix Working Group which developed guidelines for the use of hydrocarbon bearing materials (such as tank bottoms and soils) as roadmix. The Guidelines were ultimately adopted by RWQCB Region 5. This is an excellent example of a multi-interest approach to problem-solving and filling regulatory gaps. The review team commends this joint agency/industry Task Force for development of the Roadmix Guidelines.

Another example is a study undertaken by DTSC to clarify management of hazardous and non-hazardous wastes. In California, some E&P wastes covered by the federal hazardous waste exemption of 40 CFR 261.4(b)(5) are regulated as hazardous under state law. In 1999 a question arose regarding the quantities of California-regulated hazardous wastes in federally exempt E&P waste streams. In 2000 and 2001 DTSC, in cooperation with DOGGR and funded by an EPA grant, conducted a study of waste samples from selected sites to determine whether E&P wastes were generally being managed in accordance with State law. The study concluded that most federally exempt E&P wastes are not hazardous under California law. In those instances where California hazardous wastes are present, guidance is given to the generators to properly characterize and manage the wastes.

Abandoned Wells Program

DOGGR has a thorough procedure for identifying idle-wells and well sites that may constitute a threat to public health and safety or the environment, and for determining whether a responsible party exists (see Section IV., *Abandoned Sites*, for discussion of the idle-well programs and definitions of idle-well terms). DOGGR has developed and maintains an active inventory of orphaned wells. To track the number of idle wells in the state, the DOGGR maintains an inventory of

idle wells which may be downloaded from the DOGGR web page. DOGGR compiles monthly Well Production and Injection Reports submitted by operators and other data to identify: # of wells operated, # of idle wells, # of long-term idle wells (both 10-year and 15-year inventories), and # of observation wells. When a new orphaned well is identified, it is evaluated as to its potential threat to health and the environment and placed on the state's inventory of orphaned wells for tracking and plugging. DOGGR also responds to all referrals by other agencies and citizen complaints. Procedures are in place for attempting to notify the last known responsible party, and providing legal notice. In cases where there may be overlapping jurisdictions, agency activities are coordinated and emergency protocols are in place if instant remedial action is required.

DOGGR also sets annual targets for plugging of orphaned wells, and tracks its performance in meeting the targets. DOGGR's rules also create an incentive for operators to bring idle wells back into production, thereby avoiding abandonment. In 1997, the California legislature adopted legislation that attaches the ultimate liability for proper plugging and abandonment of wells to the operator of the well on January 1, 1996. In this way, as well ownership changes, the January 1, 1996 owners build assurance for future proper plugging and abandonment into contracts for transfer.

Data Management

DOGGR has made great strides in automating its record keeping and other business processes and in posting data on its website. DOGGR's WellStat data management system, used to manage monthly production and injection reports submitted by operators, is an innovative system that has potential for expanded utility to DOGGR, operators and the general public. Current information includes a list of all active wells, production and injection volumes, production and injection days, pressures, etc. Expansion of the WellStat data management system will include well permitting and field inspection data. The information is posted monthly on the DOGGR's web page and printed in the Annual Report.

DOGGR is developing an Internet-based electronic bi-directional permitting system (ePermit) to streamline the permitting process. The ePermit is nearing completion and is being tested before being released to the oil and gas industry.

CALIFORNIA STATE FOLLOW-UP AND SUPPLEMENTAL REVIEW FINDINGS AND RECOMMENDATIONS

Note: The text under each subheading entitled “California Response” was extracted from the state’s initial survey response and may not reflect additional information made available to the review team during the course of the review.

I. General Criteria (Guidelines Section 3)

Follow-up to Initial Review Recommendations

INITIAL REVIEW FINDING I.1.

As DOGGR acknowledged during the in-state review, DOGGR's pit standards warrant improvement.

INITIAL REVIEW RECOMMENDATION I.1.

DOGGR should review and revise its rules governing pits. (See [Initial] Findings and Recommendations III.1 and VI.11.)

CALIFORNIA RESPONSE:

DOGGR – The DOGGRGR does not have primary authority over sumps or pits. The DOGGR has regulations restricting sumps from drainage areas, and unlined sumps are restricted from areas overlying shallow groundwater. Also, drilling sumps must be removed (closed) before a drilling bond is released.

SWRCB – The RWQCBs have authority for discharges to land, permit the construction of sumps, specify how sumps are constructed, what is allowed in sumps, and how they are closed. The DOGGR met with the RWQCB’s staff to review the sump-oversight issue. A modified Department of Conservation/State Water Resources Control Board MOU (giving the DOGGR the responsibility) was pursued unsuccessfully.

In mid-1993, the Bureau of Land Management (BLM) and Region 5 RWQCB reached agreement on a set of sump-closure guidelines affecting BLM leases in the San Joaquin Valley. The BLM sump closure guidelines are used by the Region 5 RWQCB office on a region-wide basis. DOGGR pursued an MOU [Memorandum of Understanding] with RWQCB on sump closure jurisdiction, but particularly with the adoption of the BLM closure standards, DOGGR does not feel it remains an issue.

Local land-use authorities also have some jurisdiction.

FOLLOW-UP REVIEW FINDING I.1

Technical criteria for pits are discussed in Section 5.5 of the Guidelines. However, the above response, along with responses to questions from the review team, indicate that several agencies and jurisdictions have varying degrees of responsibilities and involvement in the regulation of pit construction and control. As indicated above, an MOU with the Department of Conservation/State Water Resources Control Board giving DOGGR primary oversight responsibility was pursued by the DOGGR unsuccessfully. There remains a “gray area” regarding standards for workover and reserve pits. The primary authority is the SWRCB,

although there are some requirements in DOGGR. For further discussion, see the findings and recommendations regarding technical criteria for pits and inter-agency coordination under III., Technical Criteria.

INITIAL REVIEW FINDING I.5

DTSC's land disposal restrictions and IWMB's landfill diversion/beneficial use programs will form the cornerstone of a comprehensive waste management hierarchy for E&P wastes, provided the DTSC restrictions take effect as scheduled and the relevant LEAs incorporate E&P wastes into their hierarchy activities within a reasonable time frame.

INITIAL REVIEW RECOMMENDATION I.5

Further progress in implementing the waste management hierarchy is strongly encouraged by the review team. IOGCC Guidance section 5.1e.

CALIFORNIA RESPONSE:

DOGGR – The majority of the E&P wastes managed by the DOGGR are injected into UIC Class II wells for disposal. The DOGGR has expanded the definition of a Class II-type fluid to include CoGen waste fluids, non-haz tank bottoms, oil-contaminated soils, NORM, and slurried drill cuttings. The EPA [U.S. Environmental Protection Agency] has approved each expansion. Injection of these wastes minimizes surface treatment and disposal. DOGGR's ongoing lease inspections help to ensure proper lease maintenance and a reduction in the number of spills.

FOLLOW-UP REVIEW FINDING I.5

See Follow-up Review Finding I.16 and Supplemental Review Findings and Recommendations I.1 and III.3 below (pp. 15, 41).

INITIAL REVIEW FINDING I.8.

The legislature now requires that wastes DTSC considers hazardous on the basis of the narrative toxicity criterion (i.e., wastes deemed hazardous based upon presence of carcinogens) must be identified by regulation. Accordingly, regulations must now be issued for all wastes DTSC deemed hazardous due to the narrative toxicity criterion, including any E&P wastes.

INITIAL REVIEW RECOMMENDATION I.8.

Although beyond the scope of the IOGCC Guidelines, DTSC should review its rules to determine if any E&P wastes warrant regulation as hazardous wastes under the narrative criterion.

CALIFORNIA RESPONSE:

SWRCB – Regions have no information. However, Region 3 has unsuccessfully requested DTSC help on the waste classification issue of KD distillate. KD distillate was determined to be hazardous by the Hazardous Materials Laboratory for toxicity and ignitability and some of it was found to contain PCBs that were likely to exceed the STLC [state toxic level of contamination] at the time they were spilled. Following the sampling discussed in Rec. 1.4, no action was taken or proposed.

FOLLOW-UP REVIEW FINDING I.8

DTSC identifies the hazardous waste criteria by regulation. Generators are required to determine whether E&P wastes meet the criteria. Although beyond the scope of the guidelines, this recommendation has been met.

INITIAL REVIEW FINDING I.9.

The variety of state and local agencies involved in E&P waste regulation contributes to the complexity of the regulatory program.

INITIAL REVIEW RECOMMENDATION I.9.a.

The complexity of the California program should be counterbalanced by aggressive outreach and education programs for the regulated community and the public. Such programs should extend beyond the workshops conducted, or materials currently prepared by individual agencies which tend to focus exclusively on their own programs. IOGCC Guidance section 4.2.2.2.

CALIFORNIA RESPONSE:

DOGGR – The DOGGR has developed effective public/industry outreach and education programs, but has not coordinated the efforts with other agencies because policies and regulations within each agency change regularly. However, each state agency provides information to its regulated community and the public on its own regulations.

In addition, the basic purpose of the California Environmental Quality Act (CEQA) is to: inform governmental decision makers and the public about the potential significant environmental effects of proposed activities; identify ways that environmental damage can be avoided or significantly reduced; require changes in a project through the use of alternatives or mitigation measures when feasible; and disclose to the public the reasons why a project was approved if significant environmental effects are involved.

SWRCB – Region 3 has conducted several erosion control workshops and initiated MOU meetings with Santa Barbara County and the local DOGGR office. The Regions have made several outreach efforts. Attempts at regular meetings in Region 3 among industry, County, and DOGGR have been unsuccessful.

Region 5 Fresno staff participates in numerous oil industry conferences annually; is a member of the IOPA Oil and Gas Workgroup (which includes DOGGR, BLM and industry) and interacts with WSPA [Western States Petroleum Association] and CIPA [California Independent Petroleum Association]; has made presentations at West Coast PTTC workshops; regularly interacts with staff and management of the DOGGR offices in Bakersfield, Coalinga and Sacramento; served on the Exploration and Production Industry Regulation Reform Task Force in 1995; served on the Sump Closure Subcommittee with interested agencies and industry in the development of the “Oilfield Surface Impoundment Closure Guidelines” subsequently adopted by U.S. Department of the Interior, BLM; served on the committee with DOGGR and the Department of Fish and Game in the development of the San Joaquin Valley Oil Spill Reporting Field Rule; and served with the Regulatory Task Force Road Mix Working Group on the issues relating to the beneficial use of road mix and in 1998 served on an NPDES ad hoc government/industry committee which developed a resource guide for industry entitled “*NPDES Permit Compliance and Enforcement – A Resource Guide for Oil and Gas Operators.*”

FOLLOW-UP REVIEW FINDING I.9a

The primary agencies involved in oil and gas E&P waste issues are actively involved in outreach and education programs for the regulated community and the public, and are partially meeting the goals of this recommendation. The DOGGR, particularly, is to be commended for its efforts with the oil and gas work groups, the bi-annual oil and gas conference, and development of the Department’s database and web site. However, industry representatives on the review team remarked that “there is still no one single source” for regulatory information, and that this makes it more difficult and expensive for industry in its day-to-day attempts to meet regulatory

requirements. The broader goal of clarifying and communicating the roles and responsibilities of the involved state agencies needs to be addressed.

FOLLOW-UP REVIEW RECOMMENDATION I.9a

The review team recommends that industry and involved state agencies develop a formal “roadmap” which explains the structure and responsibilities of the agencies involved in all aspects of the program. (Guidelines 3.1.e and 4.4).

INITIAL REVIEW RECOMMENDATION I.9.b.

A user-friendly guide to the various E&P [exploration and production] waste requirements of all the principal state, regional, and local agencies should be published and distributed widely. Given the Division's previous efforts in producing user-friendly documents and their field presence (see discussion below regarding funding and resources), the Division should take the lead in producing such a document in close consultation with the other agencies.

CALIFORNIA RESPONSE:

DOGGR – The development and publishing of a guideline would be difficult and expensive because of the frequent changes to regulatory and statutory requirements from each agency. The effort to maintain a comprehensive, up-to-date, user-friendly guide to E&P waste management requirements would require substantial staff time, which would be better spent performing more direct E&P waste-management functions.

However, the DOGGR, SWRCB and DTSC each have developed Internet home pages. For example, the DOGGR Internet home page provides information on its programs, access to statutes and regulations, reports and publications, maps, production and injection data, an information and resource directory, and links to district offices, other agencies and organizations. The DTSC home page includes information on its programs and program requirements, including access to statutes and regulations. Also, DTSC's home page includes a status report on proposed legislation and regulations, an information and resource directory, and links to the different programs. The SWRCB home page includes a directory list of Regional Offices, public information files, application forms, the Water Code and regulations, hearing transcripts and meeting schedules. Persons needing information and assistance from the various agencies can access these home pages for immediate information and, in some cases, e-mail their requests.

FOLLOW-UP REVIEW FINDING I.9b

The state response above indicates that the agencies have only partially met this recommendation. In lieu of producing a user-friendly printed document, the agencies have instead focused on the development of comprehensive Internet web sites. The review team commends the state agencies for these efforts. Public interest stakeholders would also benefit from a “single source” printed document. The DOGGR did provide the review team with a copy of a pamphlet it had produced several years ago for public dissemination; however, this document is outdated and seems to have a more general focus than was the original intent of this recommendation. It should also be noted that California state agencies, such as the Department of Conservation and SWRCB, have their own in-house printing and publishing shops, and that other possible sources of funding for producing a printed document may be available.

FOLLOW-UP REVIEW RECOMMENDATION I.9b

For the benefit of the general public, Cal-EPA and the California Resources Agency should pursue the publication and distribution of a basic, user-friendly printed guide to the various E&P

waste requirements of the principal state, regional, and local agencies, in close consultation with those agencies. (Guidelines 3.1.e, 4.2.2.2, and 4.4)

INITIAL REVIEW FINDING I.10.

The present lack of coordination in data gathering, and the resulting data gaps, potentially affect many aspects of state and local E&P waste programs, including regulatory development, allocating resources, and implementing waste management hierarchies mandated by state law.

INITIAL REVIEW RECOMMENDATION I.10.

A comprehensive examination of data needs and mechanisms for information sharing should be conducted and involve the relevant state and local agencies. The Division should lead this effort, given the activities it has already conducted and the efforts underway to improve its data processing capabilities.

CALIFORNIA RESPONSE:

DOGGR – The DOGGR’s WellStat data management system is used to manage monthly production and injection reports submitted by operators. The information includes a list of all active wells, production and injection volumes, production and injection days, pressures, etc. The information is posted monthly on the DOGGR’s web page and printed in the Annual Report.

DOGGR is developing an Internet-based electronic bi-directional permitting system (ePermit) to streamline the permitting process. The ePermit is nearing completion and is being tested before releasing it to the oil and gas industry.

Furthermore, expansion of the WellStat data management system will include well permitting and field inspection data.

SWRCB – Region 3 through the Guadalupe mitigation fund provided resources for the Santa Maria DOGGR office to obtain historic air photos of oil field operations for public, industry and agency access. The Bakersfield DOGGR office provides electronic database files on leases, sumps, and other oilfield information regularly to the Region 5 Fresno office

FOLLOW-UP REVIEW FINDING I.10

This recommendation has been partially met: state agencies are making commendable progress in their data collection processes. However, a comprehensive examination of data needs and mechanisms for information sharing related to management of E&P wastes has not been conducted, and individual agencies are not now working with the other agencies to share data in order to fill specific data gaps. Pending state legislation would provide for a search of multiple state databases through one “portal,” and would add GIS capabilities. This legislation would also provide significant funding for this effort (\$3 million each year for three years).

FOLLOW-UP REVIEW RECOMMENDATION I.10

The review team recommends that state agencies continue to search for information sharing mechanisms in order to fill gaps in their individual data. (Guidelines 3.1.e and 4.2.8)

INITIAL REVIEW FINDING I.11.

While some of the agencies involved in E&P waste regulation coordinate certain activities, the current level of coordination is not commensurate with the division of responsibilities among the agencies. Greater coordination is necessary to optimize resources and ensure consistent policy

direction and enforcement. The need not only exists across agency lines, but within agencies, including RWQCBs.

INITIAL REVIEW RECOMMENDATION 1.11.

The review team recommends the continuation of streamlining and coordination efforts while retaining the substantive strengths of the various programs. IOGCC Guidance section 4.4.

CALIFORNIA RESPONSE:

DOGGR – Communication among the DOGGR's district offices continues to deliver a coordinated program. Also, contacts between the DOGGR and other agencies have expanded.

SWRCB – State and Regional Board staff created a draft process to categorize contaminated soils. Scientific peer review requirements and the need to pursue a formal rulemaking has kept the process draft.

FOLLOW-UP REVIEW FINDING 1.11

The State agencies have made significant progress on this recommendation. There is currently much more day-to-day communication between the agencies than existed in 1993. In addition, some previous areas of duplication of agency responsibility have been eliminated. There have been specific improvements in four areas: roadmix authority and responsibility; oilspill reporting; the idle/orphaned well program; and emergency response.

FOLLOW UP REVIEW RECOMMENDATION 1.11

Given the complexity of the California regulatory system, the review team recommends that the agencies continue streamlining and coordination efforts while retaining the substantive strengths of the various programs. (Guidelines 3.1.e and 4.4). See also Follow-up Review Finding and Recommendation 1.9a, above.

INITIAL REVIEW FINDING 1.12.

The 1982 MOU between DOGGR and SWRCB needs updating in areas, including, but not limited to, the coordination of activities involving drilling and other temporary pits.

INITIAL REVIEW RECOMMENDATION 1.12.

The MOU between DOGGR and SWRCB should be revised and updated, closely following DOGGR's revisions of its pit rules and other relevant requirements. DOGGR should also consult with SWRCB and RWQCB staff regarding water quality issues to be addressed in its revised rules. IOGCC Guidance section 4.4.

CALIFORNIA RESPONSE:

DOGGR – The DOGGR has discussed possible MOU revisions and other water-quality issues with the SWRCB and RWQCBs. An MOU between the DOGGR, SWRCB, and the Department of Fish and Game was developed to outline the procedures for modifying notification requirements for onshore drilling and production oil spills (Attachment 2).

Coordination between DOGGR and DTSC is needed because some E&P exempt wastes are regulated as hazardous waste in California. Areas of particular importance include the routine sharing of information, such as notification to DTSC when certain materials like oil-based drilling muds or solvents are used at a lease site, the sharing of inspection information related to waste management, and the gathering of information that can help DTSC ensure E&P wastes are classified appropriately as hazardous or nonhazardous.

FOLLOW-UP REVIEW FINDING I.12

This recommendation has been partially met. DOGGR, the SWRCB, and the RWQCB's discuss water quality issues on a frequent basis, or at least as the need arises. The agencies should be commended for the 1998 MOU between the DOGGR, SWRCB, and the Department of Fish and Game regarding requirements for onshore drilling and production oil spills. However, the "gray area" concerning workover and reserve pits/sumps between DOGGR and SWRCB and the RWQCB's discussed in Initial Review Recommendation I.1 still exists and is dealt with only in an informal fashion. For further discussion of this issue, see findings and recommendations concerning the technical criteria for pits in III. Technical Criteria (pp. 35-38, 42-43).

INITIAL REVIEW FINDING I.13.

Greater coordination is needed between DTSC and DOGGR.

INITIAL REVIEW RECOMMENDATION I.13.

An MOU between DOGGR and DTSC should be prepared, outlining areas of coordinated activities. In addition, DOGGR should revise Section 1775(a) of its rules to reference DTSC requirements. IOGCC Guidance section 4.4.

CALIFORNIA RESPONSE:

DOGGR – The DOGGR explored the possibility of developing an MOU between the agencies to address waste disposal of certain RCRA-exempt E&P hazardous wastes that could be injected in a Class II disposal well. Recently, however, the MOU was determined not necessary because most, if not all, RCRA-exempt E&P hazardous wastes that may be injected in a Class II disposal well are considered exempt from DTSC oversight. The exemption, Title 22 CCR, Section 66261.24, incorporates the federal exemption in 40 CFR 261.4, but with the following limitation: The exemption is valid if toxicity is determined solely due to TCLP. If toxicity is established by criteria other than TCLP, or if the waste meets other characteristics of hazardous waste (ignitability, corrosivity, reactivity), the exemption does not apply.

FOLLOW-UP REVIEW FINDING I.13

This recommendation has been substantially met. The purpose of the recommendation for amendment of Section 1775(a) would be better achieved with the "roadmap" recommended in Finding and Recommendation 1.9a. Although there has not been an MOU developed, there is good communication between DOGGR and DTSC. While there is still the possibility for such an MOU, neither agency feels that there is a need to develop one at this time. The statutory division of jurisdiction is very clear and an MOU would likely not add anything to the relationship between the agencies.

INITIAL REVIEW FINDING I.16

California's emphasis on the waste management hierarchy is one of the strengths of the regulatory program. Greater coordination is needed between all the agencies to achieve this important policy directive.

INITIAL REVIEW RECOMMENDATION I.16

The review team recommends that all agencies develop a mechanism to share information regarding source reduction, recycling, and treatment technologies applicable to E&P wastes. IWMB should encourage LEAs to incorporate these techniques into their waste management plans to complement DTSC program development. IOGCC Guidance sections 4.4 and 5.1e.

CALIFORNIA RESPONSE:

DOGGR – Further evaluation is necessary.

FOLLOW-UP REVIEW FINDING I.16

The original finding is still applicable. See further discussion of waste management hierarchy in this section, below.

Supplemental Review Findings and Recommendations

GUIDELINE 3.2

...When establishing regulations and policies for E&P waste management, states should use the waste minimization hierarchy set forth in Section 5 to encourage waste minimization and source reduction.

SUPPLEMENTAL REVIEW FINDING I.1

Section 5.3 of the Guidelines suggests that “the choice of an E&P waste management option should be based upon the following hierarchy of preference”:

- a. Source Reduction
- b. Recycling
- c. Treatment
- d. Proper Disposal

Unfortunately, the current Questionnaire For Follow-Up And Supplemental Review of state E&P waste management programs contains no questions relating specifically to this Guideline. The logical question to ask might be simply: “Describe your agency’s waste minimization hierarchy as set forth in Section 5 of the Guidelines.” Lacking a specific question, the review team considered responses to other portions of the Questionnaire and to questions asked during the follow-up review meetings.

Both DOGGR and SWRCB have mission statements and strategic plans that contain the goals and objectives of the State’s waste management programs, including E&P wastes. In addition, DOGGR includes technical criteria for E&P waste management practices in its Manual of Instructions (MOI), while technical criteria for E&P waste management practices for SWRCB are contained in multiple formal documents. It is unclear whether or not a specific waste minimization hierarchy is included in any of the above noted documents or has been formally established by either of these agencies.

Responses to questions during the follow-up review meetings clearly demonstrate that DOGGR and the RWQCBs increasingly include “beneficial use” (or recycling) as a significant waste management option. Examples include the re-use of produced water, clean drilling muds, clean oil, and “lightly contaminated” soils. However, Region 3 RWQCB in particular has encountered some difficulties along the way, particularly regarding reuse of lightly contaminated soils for road base. Region 3 believes that “lightly contaminated soils” have not been adequately defined and that appropriate engineering has not always been used in implementing some projects. To some degree this may be due to regional variances: for example, soils contaminated with KD distillate are a problem in Region 3, but apparently not a problem in Region 5. WSPA (industry association) and state and local agencies have developed a road-mix protocol for Region 5. Region 3 says it is interested in developing a road-mix protocol, but the KD distillate issue complicates matters. Also see Follow-up Review Finding I.16, above (p.16).

SUPPLEMENTAL REVIEW RECOMMENDATION I.1

DOGGR, SWRCB and the RWQCBs should establish formal waste management hierarchies as set forth in Section 5.3 of the Guidelines to encourage waste minimization and source reduction. These hierarchies should then be integrated into the normal waste management programs of each agency. These agencies, along with DTSC and IWMB, should continue to explore ways to work cooperatively in these efforts. (Guideline 3.2).

II. Administrative Criteria (Guidelines Section 4)

Note: WDRs, or “Waste Discharge Requirements,” are permits issued by RWQCBs consistent with their basin plans.

Follow-up to Initial Review Recommendations

INITIAL REVIEW FINDING I.18.

Given the primary role the RWQCBs assume in regulating E&P wastes, resource deficiencies in those agencies impair the effectiveness of E&P waste regulation, generally. Since general revenues are not a likely source of additional funds, other sources of agency funding must be examined to alleviate current shortfalls. In particular, the discharge fees are now capped by statute at \$10,000 for the largest facilities. This cap prevents the RWQCBs from recouping the actual cost of issuing WDRs for very large and complex facilities, and forces SWRCB to raise the fees for smaller dischargers, resulting in disproportional fee allocations.

INITIAL REVIEW RECOMMENDATION I.18.

SWRCB should obtain the resources necessary to fully discharge its responsibilities. One option is to remove or raise the statutory cap on discharger fees, so that SWRCB may restructure its fee system to improve its equity and cure substantial resource shortcomings. IOGCC Guidance section 4.3.2.

CALIFORNIA RESPONSE:

SWRCB – Region 5 Fresno has allocated 2-3 staff annually to the resolution of oilfield issues. The Governor has proposed raising the cap on discharger fees. However, additional program funding would not be available.

FOLLOW-UP REVIEW FINDING I.18

While staffing and funding seems to vary from region to region, the fact remains that SWRCB has not obtained the necessary resources to meet this recommendation. In addition, there is currently a state government hiring freeze in effect.

FOLLOW-UP REVIEW RECOMMENDATION I.18

The review team recommends that the SWRCB continue efforts to obtain and/or allocate the resources necessary to fully discharge its responsibilities. (Guidelines 3.1.d, 4.3.1, and 4.3.2).

INITIAL REVIEW FINDING I.19.

A significant number of production pits have not received WDRs from the RWQCBs due to resource shortfalls. While the operators of these pits are subject to basin plan and Chapter 15 requirements, their actual permits or approvals to operate are decades old, and RWQCBs cannot verify whether they are in compliance. Landspreading operations may not be receiving applicable WDRs, either. The review team believes this backlog in WDR issuance is a very serious program deficiency that warrants priority attention.

INITIAL REVIEW RECOMMENDATION I.19.

Facilities without WDRs should be evaluated and issued WDRs as soon as possible. Additional resources should be devoted to this task if necessary to complete the work. IOGCC Guidance sections 4.1. and 5.3.2.a.

CALIFORNIA RESPONSE:

SWRCB – Regions have made progress toward this recommendation. Region 3 has entered into a MOU with Santa Barbara County to implement part of this requirement but Region 3 is unaware of substantial activity related to this recommendation.

Resources in Region 5 Fresno are focused on resolving outdated WDRs in the region. As a result numerous sumps have been closed, disposal converted to injection wells, and the WDRs rescinded. New WDRs for facilities subject to Title 27 (not in compliance with Basin Plan limitations) contain time schedules to come into compliance and generally choose to close rather than construct lined sumps and groundwater monitoring wells. Others have opted to conduct a site-specific hydro-geologic study to describe conditions, or have determined that the wastewater meets Basin Plan numerical limitations, which to date have resulted in adoption of several Non-Chapter 15 WDRs where no particular threat to groundwater is perceived but monitoring of the facility operations and wastewater characteristics are appropriate.

FOLLOW-UP REVIEW FINDING I.19

See Follow-up Review Finding and Recommendation II.7, below (p. 23).

INITIAL REVIEW FINDING I.20.

Thirteen in-house attorneys provide legal advice to State/Regional Water Boards. When litigation is commenced, the Boards rely upon the Attorney General's office. SWRCB staff indicated resource constraints at the Attorney General's office can produce delays in conducting necessary litigation.

INITIAL REVIEW RECOMMENDATION I.20.

Additional legal support through the Attorney General's office, or other means, should be provided to address delays in conducting litigation. IOGCC Guidance section 4.3.1.2.

CALIFORNIA RESPONSE:

SWRCB – Region 3 has used the Attorney General's staff at the Guadalupe oil field and the large spill between the tank battery and ship loading facility at Avila Beach. Region 5 Fresno has no issues. SWRCB legal staff has increased.

FOLLOW-UP REVIEW FINDING I.20

This recommendation has been met. The situation has apparently improved. The SWRCB has sufficient legal staffing. However, water board attorneys cannot litigate, so the boards must rely on the Attorney General's office to pursue legal action. While the review team was told by one agency official that there is "not enough staff at the Attorney General's office," there were no specific instances cited where this created problems for the water boards.

INITIAL REVIEW FINDING I.21.

The training programs of DOGGR and the Water Boards are positive features of their E&P waste programs. However, those training programs tend to focus on only their own programs, ignoring the interrelationship between their programs and the requirements of other state and local agencies. Moreover, DTSC, APCD, LEA and relevant county personnel, should be provided training that covers the complete picture of E&P waste management. In short, personnel training is an important area where greater coordination is required.

INITIAL REVIEW RECOMMENDATION I.21.

Cross-training should be provided for those officials substantially involved in the regulation of E&P wastes. IOGCC Guidance section 4.4.

CALIFORNIA RESPONSE:

DOGGR – In 1994, the DOGGR conducted a broad-based workshop that included the SWRCB, DTSC, and other state and federal agencies. This effort was funded through the IOGCC/DOE.

SWRCB – Region 3 has some cross-training with Santa Barbara County and the Santa Maria DOGGR office, but none with DTSC, APCD or the LEA.

FOLLOW-UP REVIEW FINDING I.21

This recommendation has been largely met. DOGGR describes the 1994 workshop as effective. However, there are still concerns over funding future workshops and training sessions.

FOLLOW-UP REVIEW RECOMMENDATION I.21

The review team recommends that the agencies continue to provide inter-agency training as funding is available. (Guidelines 3.1.d, 4.3.1, 4.3.1.3, 4.3.1.5, and 4.4).

INITIAL REVIEW FINDING I.22.

Resources devoted to E&P waste activities, particularly at the field level, are not always proportional to agency responsibilities. For example, DOGGR's field presence is at a more appropriate level than RWQCBs, even though RWQCBs bear a larger permitting and enforcement role in regulating E&P wastes.

INITIAL REVIEW RECOMMENDATION I.22.

In addition to revising the MOU with SWRCB, as discussed previously, DOGGR should explore with the various affected state and local agencies, including APCDs, LEAs, DTSC and county governments, mechanisms by which DOGGR inspectors can provide information and reporting of suspected violations to these agencies. IOGCC Guidance section 4.4.

CALIFORNIA RESPONSE:

DOGGR – The DOGGR has a number of MOUs with other state and federal agencies (see Attachment).

SWRCB – Region 5 Fresno staff interacts on a regular basis regarding complaints, enforcement and inspections with DOGGR field inspectors with the Bakersfield and Coalinga offices; the field staff with the BLM office in Bakersfield; US F&WS and California F&G staff; and occasionally with APCD, LEAs and DTSC.

FOLLOW-UP REVIEW FINDING I.22

This recommendation has been met. DOGGR inspectors provide information and reporting of suspected violations to other jurisdictional agencies.

INITIAL REVIEW FINDING II.4.

DOGGR is currently reviewing its program and may request legislation to strengthen operator financial assurance requirements.

INITIAL REVIEW RECOMMENDATION II.4.

The review team encourages DOGGR to undertake a comprehensive review of its financial assurance program to determine if it is adequate to provide an incentive for proper plugging of a well and reclamation of a site. IOGCC Guidance section 4.2.3.

CALIFORNIA RESPONSE:

DOGGR – Legislation was passed in 1998 that gave operators a set of options to cover the liability for their long-term idle wells. First, an operator could take out a \$1 million blanket bond to cover all its operations, including idle wells. Second, operators could choose to pay the annual idle well fee, but on an increased scale reflecting relative hazard potential: a per well fee would be \$100 for wells idle less than 10 years; \$250 for wells idle 10-15 years; and \$500 for wells idle for more than 15 years. Third, operators may take out a \$5,000 bond for each individual idle well; fourth, operators may establish an escrow account for each idle well that must be worth \$5,000 after 10 years (any interest earned in the escrow account will be returned to the operator); and fifth, operators may establish an idle-well management plan that requires operators to eliminate a certain percentage of long-term idle wells (10 years or longer) on an annual basis. For purposes of the plan, eliminate means to return to production, plug and abandon (clean-up), or turn that well into an injection or observation well. An operator choosing the plan option would not be subject to any additional idle well fees or bonding requirements. If the operator failed to meet the annual goals outlined in its plan, the operator would immediately be required to secure idle well bonds or establish an escrow account for the wells.

The DOGGR also increased bonding amounts for active wells by \$5,000. Individual well bonds increased to \$15,000 for wells less than 5,000 feet in depth; \$20,000 for wells between 5,000 and 10,000 feet; and \$30,000 for wells in excess of 10,000 feet. Furthermore, the blanket bond amount was increased to \$250,000 for operators with more than 50 wells. The 1998 change was necessary to ensure adequate funding for continued plugging and abandoning operations because costs had increased. The previous rates were established in statute in 1976.

FOLLOW-UP REVIEW FINDING II.4

This recommendation has been met. DOGGR completed the review of its financial assurance program, and obtained legislation defining plugging liabilities and establishing new financial assurance requirements. Over time, increased costs and other developments may necessitate further adjustments in the financial assurance requirements. See also Supplemental Review Finding IV.4 (p. 52).

FOLLOW-UP REVIEW RECOMENDATION II.4

DOGGR should periodically review the amount of financial assurance required to determine if it is adequate to provide incentive for proper plugging of a well and reclamation of a site, and to assure proper management of E&P wastes. (Guidelines 4.2.4. and 6.4).

INITIAL REVIEW FINDING II.5.

RWQCBs do not have a permit (WDR) application guidance document to assist an operator in determining the information needed for a "complete" application. RWQCBs encourage applicants to hold a pre-application meeting with their staff to identify the required information.

INITIAL REVIEW RECOMMENDATION II.5.

The team recommends RWQCBs develop a WDR application guidance document to help expedite the permitting process. IOGCC Guidance section 4.2.2.2.

CALIFORNIA RESPONSE:

SWRCB – No general guidance specific to E&P exists.

FOLLOW-UP REVIEW FINDING II.5

This recommendation has not been met, however, no further action is recommended at this time. Given the relatively small number of E&P activities requiring a WDR, the development of an application guidance document is not a high priority for the SWRCB or the RWQCBs. The need for guidance is met through telephone communications and pre-application meetings between the applicant and the RWQCB staff.

INITIAL REVIEW FINDING II.7.

Due to resource constraints, some discharges do not have WDRs issued by RWQCBs. These discharges may be in violation of basin plans or Chapter 15 requirements.

INITIAL REVIEW RECOMMENDATION II.7.

The review team recommends RWQCBs evaluate and issue WDRs for all discharges subject to their permitting authority. IOGCC Guidance sections 4.1.1. and 5.3.2.

CALIFORNIA RESPONSE:

SWRCB – There are not enough resources to implement this recommendation at Region 3 or 5.

FOLLOW-UP REVIEW FINDING II.7

Region 5 has redirected resources to meet this recommendation. As a result, the backlog of WDRs in Region 5 has been reduced from 300 to 125. Little has changed in Region 3 in response to the recommendation. Region 3 reports having only four pending applications for WDRs, but many others may be required for remediation and restoration projects. E&P waste issues such as the remediation of abandoned sumps and the beneficial use of contaminated soils appear to be straining Region 3's resources.

FOLLOW-UP REVIEW RECOMMENDATION II.7

All regions should evaluate and issue timely and appropriate WDRs for the E&P activities subject to their permitting authority. The SWRCB should ensure that the RWQCBs address E&P waste management activities in their annual work plans and that the RWQCB budgets provide the necessary staffing and other resources to meet work plan commitments related to E&P activities. (Guidelines 4.1.1. and 5.5.2.)

INITIAL REVIEW FINDING II.9.

DOGGR is empowered to deny permits or permit renewals based on the compliance history of the applicant. DTSC and RWQCBs lack similar authority.

INITIAL REVIEW RECOMMENDATION II.9.

The review team recommends DTSC and SWRCB obtain statutory authority to deny permits or permit renewals based on compliance history. IOGCC Guidance section 4.1.1.

CALIFORNIA RESPONSE:

SWRCB – Regions 3 and 5 are unaware of any activity related to this recommendation.

DTSC – DTSC checks compliance history before issuing permits and may deny permits based on compliance history. DTSC also coordinates with sister agencies on compliance issues during the permitting process.

FOLLOW-UP REVIEW FINDING II.9

The intent of this recommendation has been met. Both the SWRCB and DTSC reported that they have authority to deny an application based upon the applicant's compliance history.

INITIAL REVIEW FINDING II.10.

The review team found a need for all permitting agencies to access the compliance history of an applicant from the other agencies.

INITIAL REVIEW RECOMMENDATION II.10.

The review team recommends regulations be revised or a mechanism be established to enable a permitting agency to access compliance histories from other agencies when evaluating a permit application. IOGCC Guidance section 4.1.1.

CALIFORNIA RESPONSE:

DOGGR – This information is available from the DOGGR, which, upon request, will research its files for the inquiring agency.

SWRCB – Region 3 is unaware of any activity related to this recommendation except incidental conversations with the Department of Fish & Game. Region 5 Fresno staff works closely with the DOGGR offices and the US BLM regarding these issues. SWRCB database on permitting and enforcement is public information and therefore available to other agencies at their request.

FOLLOW-UP REVIEW FINDING II.10

This recommendation has been met. Mechanisms exist for the interagency exchange of information on the compliance history of E&P operators. DOGGR, BLM and at least one RWQCB routinely share such information with one another.

INITIAL REVIEW FINDING II.13.

Permits (WDRs) issued by RWQCBs are valid for the life of the discharge; however, they are reviewed and may be revised on a fixed schedule, or when the nature of the discharge has changed. The fixed review schedule is based on risk and is seen by the team as an effective use of limited manpower resources. Lack of resources has prevented RWQCBs from reviewing all WDRs according to schedule.

INITIAL REVIEW RECOMMENDATION II.13.

The team recommends SWRCB seek the necessary resources from the legislature or use some other mechanism to enable RWQCBs to evaluate all existing WDRs according to their schedule. IOGCC Guidance section 4.1.1. WDRs for commercial or centralized facilities should be issued for a fixed term and reviewed at least once every five years. IOGCC Guidance section 5.7.2.1.a.

CALIFORNIA RESPONSE:

SWRCB – WDRs are reviewed in accordance with a fixed schedule of 5, 10, and 15 years based on threat to water quality.

FOLLOW-UP REVIEW FINDING II.13

The resource issue raised in this recommendation is addressed in Follow-up Review Finding and Recommendation II.7 above (p. 23).

As for the schedule of reviews for centralized and commercial facilities, the RWQCBs review all WDRs periodically. WDRs are reviewed on a 5-, 10-, or 15-year schedule, depending on the risk category of the facility. The SWRCB rules establish the risk categories.

Though the review process does not precisely follow the Guidelines with respect to review of commercial and centralized waste management facilities, the RWQCBs have articulated a rational basis for believing that their approach to the periodic review of WDRs protects the waters of the state. The state therefore meets the Guidelines criteria.

INITIAL REVIEW FINDING II.14

Permits issued by DTSC are valid for ten years.

INITIAL REVIEW RECOMMENDATION II.14

The review team recommends that DTSC review and revise, if necessary, commercial hazardous waste facility permits at least once every five years. IOGCC Guidance section 4.1.1.

CALIFORNIA RESPONSE:

DTSC – RCRA hazardous waste permits issued are valid for ten years, with a five year review by DTSC.

FOLLOW-UP REVIEW FINDING II.14

This recommendation has been met. DTSC permits for hazardous waste facilities are valid for ten years with a five-year review. This provision also meets Guideline 4.1.1.

INITIAL REVIEW FINDING II.15.

The review team is concerned that the lack of resources at RWQCBs, and the 120 day provision, may result in discharges which pose a threat to human health or the environment.

INITIAL REVIEW RECOMMENDATION II.15.

The review team recommends SWRCB seek adequate resources from the legislature or use some other mechanism to enable RWQCBs to process applications for WDRs in a timely manner. IOGCC Guidance section 4.1.1.

CALIFORNIA RESPONSE:

SWRCB – Region 3 has attempted unsuccessfully to augment. Region 5 Fresno has been able to process applications for WDRs relating to the oilfield industry in a timely manner.

FOLLOW-UP REVIEW FINDING II.15

See Follow-up Review Findings and Recommendations I.18 and II.7, above (pp. 18, 23).

INITIAL REVIEW FINDING IV.6.

Records of E&P waste activities are maintained for at least three years as suggested in IOGCC Guidance section 4.2.2.1. However, SWRCB's statutes and regulations do not provide for extension of this time for any reason.

INITIAL REVIEW RECOMMENDATION IV.6.

SWRCB should adopt regulations whereby the minimum recordkeeping time for operators is automatically extended while any unresolved enforcement action regarding the regulated activity is pending. IOGCC Guidance section 4.2.2.1.

CALIFORNIA RESPONSE:

SWRCB – Regions 3 and 5 are unaware of any activity related to this recommendation.

FOLLOW-UP REVIEW FINDING IV.6

This recommendation goes beyond the scope of the Guidelines in addressing the record-retention requirements for operators. The SWRCB and RWQCBs maintain their records indefinitely in satisfaction of the record-retention provisions of the Guidelines.

INITIAL REVIEW FINDING IV.8.

The agencies make use of ad hoc advisory groups to address specific issues or activities. In addition, SWRCB uses staff workshops for the development of certain issues.

INITIAL REVIEW RECOMMENDATION IV.8.

The agencies should use advisory groups of industry, government, and public representatives to obtain input and feedback on the effectiveness of the E&P waste management programs. Provision should be made for education or training, as appropriate, to provide the advisory groups with a sound basis for performing their functions. IOGCC Guidance section 4.2.2.3.

CALIFORNIA RESPONSE:

SWRCB – Region 3's attempts to meet with the industry during their regular meetings with the local DOGGR staff and Santa Barbara County staff have been unsuccessful. Region 3 staff has met with government and public members about orphaned sumps, but industry was not represented.

For Region 5 Fresno, see Recommendation 1.9a.

FOLLOW-UP REVIEW FINDING IV.8

This recommendation has not been met, and is not likely to be met, because neither the State nor the agencies are going to commit the resources to support a standing advisory committee for program review. However, the agencies continue to use ad hoc committees and work groups to address issues such as idle wells, spill reporting, and roadspreading. The membership of these committees includes state and federal agencies, industry, and interested citizens. The CEQA also provides opportunity for public participation in the assessment and mitigation of environmental impacts of proposed projects. In addition, California volunteered for review of its programs under both the STRONGER State Review Process and the GWPC UIC Peer Review Process.

INITIAL REVIEW FINDING V.2.

Spills reported to OES must also be reported to various other agencies, depending on the circumstances. The statutory and regulatory reporting requirements are complex and sometimes inconsistent. Also, the timing and content of the reports vary from agency to agency and from case-to-case.

INITIAL REVIEW RECOMMENDATION V.2.

The State of California should review its spill and release notification requirements and revise them as necessary for clarification and consistency. To the extent possible, the notification requirements should be simplified and streamlined. IOGCC Guidance section 4.4.

CALIFORNIA RESPONSE:

DOGGR – In 1994, the Office of Emergency Services (OES) was statutorily designated as the central reporting point in the State for spill reporting. In turn, OES notifies the proper regulatory agencies. In 1996, legislation was passed to address the oil spill threshold reporting requirements and simplify reporting. This legislation was a product of a Cal-EPA regulatory reform effort.

SWRCB – Region 3 contacts other agencies to assess details of OES reports. Region 5 Fresno has implemented the new Oilfield Spill Reporting Rules which in effect have reduced the number of minor spill reporting incidents to OES by the industry. OES reports all spill reports received to all interested agencies via fax. Staff responds as appropriate, and involves other appropriate agencies such as, BLM, F&G or USF&WS.

FOLLOW-UP REVIEW FINDING V.2

This recommendation has been met. Since the initial review, the state has designated the Office of Emergency Services (OES) as the agency responsible for receiving all spill reports. OES in turn notifies affected regulatory agencies. The state has also reviewed and revised the threshold for San Joaquin Valley oil spill reporting.

INITIAL REVIEW FINDING V.3.

DOGGR is the only agency keeping a complete computerized database of spill incidents.

INITIAL REVIEW RECOMMENDATION V.3.

The state should establish a computerized database or expand the existing databases to facilitate the sharing and analysis of information on spills of oil and E&P waste for prevention and planning purposes. These capabilities would enable the state agencies to identify problem areas warranting additional preventive measures, and provide information and assistance to operators concerning the use of technologies to reduce leaks and spills. IOGCC Guidance section 4.2.7.

CALIFORNIA RESPONSE:

DOGGR – The OES maintains a comprehensive database to record and store all reported emergencies, including oil spills. The DOGGR, Department of Fish and Game's Office of Oil Spill Prevention and Response (OSPR), State Lands Commission's (SLC) Mineral Resource Management and Marine Facilities Management Divisions, California Coastal Commission, and the State Fire Marshal formed a committee to coordinate statewide development of a comprehensive database of oil spill information. The committee recommended that OSPR develop a database and post the information on its web page. The DOGGR maintains a spill database and provides the information upon request.

FOLLOW-UP REVIEW FINDING V.3

This recommendation has not been met. The OES receives comprehensive data on spill volumes, materials, locations, sources, and causes. A committee of the various state agencies involved in spill prevention and response has discussed creating an oil-spill database and making this data available over the Internet. This committee has not met in recent years.

FOLLOW-UP REVIEW RECOMMENDATION V.3

To support cost-effective, risk-based decisions and to provide data useful in evaluating program performance, the state agencies are encouraged to resume their efforts to develop a web-based system for the oil-spill data reported to the OES, and to provide the information in another usable format on request. (Guideline 4.2.8.)

INITIAL REVIEW FINDING VII.1

None of the state agencies have waste hauler certification programs for training drivers of trucks that transport non-hazardous E&P wastes to commercial and/or centralized disposal facilities.

INITIAL REVIEW RECOMMENDATION VII.1

The review team recommends an appropriate state agency develop waste hauler certification programs for training drivers of trucks that include emphasis on proper record-keeping, the need to deliver the waste to the designated facility, and emergency response and notification procedures. An appropriate agency should have the authority to require the registration of all vehicles used to transport non-hazardous E&P waste and of all non-hazardous E&P waste haulers. IOGCC Guidance section 4.2.4.

CALIFORNIA RESPONSE:

No response.

FOLLOW-UP REVIEW FINDING VII.1

This recommendation has not been met. Waste hauling vehicles are required to be registered by the California Department of Transportation. Training programs exist for haulers of hazardous wastes. There is, however, no specific training program for E&P non-hazardous waste haulers.

FOLLOW-UP REVIEW RECOMMENDATION VII.1

The appropriate agency or agencies of the State of California should meet the requirements of section 4.2.5. of the Guidelines with regard to training of drivers and certification of waste haulers.

INITIAL REVIEW FINDING VII.2

None of the state agencies have a waste tracking program or a comparable alternative method to document the movement of non-hazardous E&P wastes from the site of origin to final disposition at commercial or centralized disposal facilities. Rather, the agencies rely on the operators of such facilities to keep any records that may be necessary for their own protection.

INITIAL REVIEW RECOMMENDATION VII.2

The review team recommends an appropriate state agency develop a waste tracking program or comparable alternative method for tracking the transportation of non-hazardous E&P wastes from well sites to commercial or centralized disposal facilities. The waste generator, waste hauler, and operator of the disposal facility should retain, and make available for inspection, all necessary waste tracking information for a minimum of three years from the date of shipment. IOGCC Guidance sections 4.2.5 and 5.7.2.3.

CALIFORNIA RESPONSE:

No response.

FOLLOW-UP REVIEW FINDING VII.2

Although DOGGR tracks the disposal of Class II fluids at commercial disposal facilities, other non-hazardous E&P wastes are not tracked by any state agency.

FOLLOW-UP REVIEW RECOMMENDATION VII.2

The appropriate agency or agencies of the State of California should meet the requirements of section 4.2.6 and 5.10.2.3 of the Guidelines with regard to waste tracking.

INITIAL REVIEW FINDING VIII.1.

The data management capabilities of the various state agencies generally meet all criteria of the IOGCC Guidance.

INITIAL REVIEW RECOMMENDATION VIII.1.

The review team recommends agencies responsible for E&P waste management in California consider development and implementation of an interagency data management program. The system should include the necessary data elements (i.e., permitting, operating, monitoring, and compliance information) to make cost-effective, risk-based management decisions. The ability to sort and track E&P waste volumes by waste type, and to perform spill analyses from appropriate data, would enhance the program. IOGCC Guidance section 4.2.7.

CALIFORNIA RESPONSE:

DOGGR – See response to RECOMMENDATION I.10.

FOLLOW-UP REVIEW FINDING VIII.1

This recommendation has not been specifically met. The projected development and maintenance costs make the recommended interagency database infeasible at this time. However, the agencies' individual efforts to develop integrated data management systems with GIS capabilities will essentially meet the intent of the recommendation.

DOGGR has made great strides in automating its record keeping and other business processes and in posting data on its website. DOGGR needs additional programming support to complete its ePermit system and to fully integrate the district office databases. It also needs funding to scan the files and logs on the state's 187,000 wells and make the resulting images available over the Internet.

The SWRCB is currently seeking funding to integrate its data management systems and scan its hard-copy files.

FOLLOW-UP REVIEW RECOMMENDATION VIII.1

To support cost-effective, risk-based decisions and provide data useful in evaluating program performance, DOGGR and SWRCB are encouraged to continue their efforts to develop management systems for their E&P waste data that incorporate ePermitting functions, GIS

capabilities and images of hard-copy files. (Guideline 4.2.8.) Also see Follow-up Review Finding and Recommendation I.10.

INITIAL REVIEW FINDING IX.1.

While RWQCBs have broad authority to inspect a facility at any time, their normal procedure includes contacting a facility in advance to scheduled inspections. This practice could lead to failure to detect improper discharges inconsistent with the facilities' waste discharge requirements (WDR).

INITIAL REVIEW RECOMMENDATION IX.1.

The review team recommends that RWQCBs use both announced and unannounced inspections. IOGCC Guidance section 4.1.2.1.e.

CALIFORNIA RESPONSE:

SWRCB – Regions 3 & 5 have always used both announced and unannounced inspections.

FOLLOW-UP REVIEW FINDING IX.1

This recommendation has been met.

INITIAL REVIEW FINDING X.1.

IWMB lacks authority to assess administrative penalties.

INITIAL REVIEW RECOMMENDATION X.1.

The review team recommends IWMB seek authority to assess administrative penalties and develop a mechanism for calculating penalties. IOGCC Guidance section 4.1.3.

CALIFORNIA RESPONSE:

None.

FOLLOW-UP REVIEW FINDING X.1

IWMB has not responded to inquiries concerning its response to this recommendation.

FOLLOW-UP REVIEW RECOMMENDATION X.1

If it has not already done so, IWMB should seek authority to assess administrative penalties and develop a mechanism for calculating penalties. Guideline 4.1.3

Supplemental Review Findings and Recommendations**GUIDELINE 4.1.1**

Where the operator responsible for E&P waste management changes, state requirements should address the new operator's financial responsibility and compliance history.

SUPPLEMENTAL REVIEW FINDING II.1a

In California, a change of operator is treated similarly to an application for a new operation. DOGGR, SWRCB and RWQCBs therefore have authority to deny transfer of existing or issuance of new permits based on financial responsibility and compliance history, consistent with Guideline 4.1.1.

GUIDELINE 4.1.1

An effective state program should provide that a state permit does not relieve the operator of the obligation to comply with federal, local, or other state permits or regulatory requirements.

SUPPLEMENTAL REVIEW FINDING II.1b

The State of California meets the provision of Section 4.1.1 of the guidelines concerning an operator's obligation to comply with all applicable federal, state, or local regulatory requirements. A permit from one state agency in California does not relieve the operator of the obligation to comply with the regulatory requirements of other state agencies, federal agencies, or local governments. The state and federal agencies and local governments in California coordinate their E&P waste management activities to ensure that applicable requirements are met.

GUIDELINE 4.2.1.1.a

The state should develop and adopt a state contingency plan for responding to spills and releases. The plan should define the volume of a spill or release of a petroleum product or waste which triggers implementation of the spill contingency plan and response requirements as well as the types of spills and/or releases covered by the program requirements, the time in which notification and subsequent clean-up should occur, and guidance or criteria relating to final remedial verification provisions to ensure that appropriate remediation has been accomplished.

SUPPLEMENTAL REVIEW FINDING II.2

The State of California's oil spill contingency plan defines the types and volumes of spills that trigger the plan, sets time limits for notification and cleanup, and provides cleanup standards. This plan meets or exceeds Section 4.2.1.1.a of the guidelines.

GUIDELINE 4.2.1.1.b

The state contingency plan should also contain funding provisions which enable the state agency to undertake immediate response actions for significant spills or releases which constitute a threat to human health or the environment in the event that a responsible operator cannot be located or is unwilling or unable to respond to the spill or release. In addition, state program requirements should contain provisions allowing the state agency to pursue a responsible operator for reimbursement for state monies expended in responding to such a spill or release.

SUPPLEMENTAL REVIEW FINDING II.3

Both DOGGR and SWRCB have access to funds that may be used to control, contain, or cleanup a spill that threatens human health or the environment in the event the responsible operator does not respond. The Office of Oil Spill Prevention and Response in the Department of Fish and Game also has access to emergency response funds. The California spill contingency program meets Section 4.2.1.1.b of the guidelines.

GUIDELINE 4.2.3

States should have a sound regulatory development process which includes both short-term and long-term strategic planning for defining goals and objectives, setting priorities, and evaluating the effectiveness of the E&P waste management program. In formulating waste management regulations, states should use the best available scientific and technical information and should consider the economic and energy impacts of the regulations.

SUPPLEMENTAL REVIEW FINDING II.4

Both DOGGR and SWRCB have mission statements and strategic plans that contain both short-term and long-term goals and objectives for the state's E&P waste management programs. The RWQCBs also prepare basin water quality plans that constitute tactical plans for accomplishment of specific objectives. On the whole, the strategic plans establish targets for completion of identified activities, and do a good job of tracking tasks. In addition, DOGGR includes technical criteria for

E&P waste management practices in its MOI, while technical criteria for E&P waste management practices for SWRCB are contained in multiple formal documents.

However, the SWRCB strategic plan appears to be driven from the top down. It is unclear how the RWQCBs are involved in the strategic planning process. And for all the agencies it is also unclear that the planning processes provide for evaluation of the effectiveness of the E&P waste management program.

SUPPLEMENTAL REVIEW RECOMMENDATION II.4

In order to evaluate whether the E&P waste management program is meeting the goal of protecting human health and the environment, DOGGR, the SWRCB and the RWQCBs should more fully integrate performance measures into their strategic planning processes. (Guidelines 3.2, 8.1, and 4.2.3).

The SWRCB should more fully involve the RWQCBs in the strategic planning process. (Guidelines 3.2, 8.1, and 4.2.3).

See also Supplemental Review Findings and Recommendations in VI. Performance Measures (pp. 63-64).

GUIDELINE 4.2.4

In the case of commercial and centralized facilities as defined in section 5.10, including those that manage oil-field NORM, state financial assurance requirements should be sufficient to cover the costs of appropriate facility decontamination, reclamation, and closure, and should extend through any post-closure care, monitoring, or control period.

SUPPLEMENTAL REVIEW FINDING II.5

Under RWQCB requirements, the operator must demonstrate financial assurance for corrective actions for known or reasonably foreseeable releases from the site and for the closure and post-closure maintenance of the site where closed with wastes remaining in place in accordance with an approved closure/post-closure plan developed by the operator. California meets the requirements of Guideline 4.2.4.

GUIDELINE 4.2.8.1

States should develop policies for data access, data dissemination, and the allocation of cost of services to governmental and non-governmental users.

SUPPLEMENTAL REVIEW FINDING II.7

The data management policies of the various State agencies generally meet the criteria of the Guidelines.

GUIDELINE 4.2.8.3

Agencies should provide for the capture of data and images as appropriate, and for both protecting the quality of data collected and the long-term protection and backup of captured information through measures such as off-site duplicate storage, archiving, and/or data retention and destruction policies. Agencies should consider including public outreach and industry data support in their data management systems.

Most program data are available to the public under various sunshine rules. Some records may be retained as confidential files for a defined period of time. Certain confidential types of data may also be discoverable. States should develop policies that define data sets to be made available to the public and/or industry.

SUPPLEMENTAL REVIEW FINDING II.8

California State agencies have policies for the collection, protection, archiving and back-up of captured data, and that information is available pursuant to California Public Records Act. Also see Follow-up Review Findings and Recommendations I.10 and VIII.1 (pp. 13, 29).

III. Technical Criteria (Guidelines Section 5)

Follow-up to Initial Review Recommendations

INITIAL REVIEW FINDING I.4.

DTSC lacks current information on the types and quantities of E&P wastes considered hazardous under California law.

INITIAL REVIEW RECOMMENDATION I.4.

DTSC should conduct field sampling activities and review available data to verify generator waste classifications and obtain better information on the waste types that may trigger a hazardous waste designation. IOGCC Guidance section 5.1.f.

CALIFORNIA RESPONSE:

SWRCB – In March 2000, DTSC and Region 5 Fresno staff collected approximately 40 wastewater and sludge samples from 15-18 ponds at 6-7 of the facilities operated by Valley Waste Disposal in western Kern County. No hazardous constituents or concentrations were determined present.

FOLLOW-UP REVIEW FINDING I.4

DTSC has partially met the recommendation in that DTSC did conduct field sampling activities to obtain better information. However, analysis of this information is still in draft form, and it would be difficult to term this study as “exhaustive.” DTSC has information on types of E&P wastes considered hazardous through the waste manifest information system.

FOLLOW-UP REVIEW RECOMMENDATION I.4

The review team recommends that DTSC review the waste manifest information already provided by generators, obtain waste characterization information already collected by operators, and conduct additional field sampling if necessary for assessment and use in waste classification and implementation of the state waste management program. (Guideline 5.2.2.a)

INITIAL REVIEW FINDING I.14.

A consistent policy on roadspreading of E&P wastes is needed across all the affected agencies.

INITIAL REVIEW RECOMMENDATION I.14.

Cal-EPA should establish a task force or use another mechanism to examine whether and under what circumstances the roadspreading of nonhazardous E&P wastes should be allowed. Representatives from DTSC, CARB, State/Regional Water Boards, the Division, APCDs, and LEAs should be involved and the results should include recommendations to the various agencies for consistent rules or policies protecting the various environmental media.

CALIFORNIA RESPONSE:

DOGGR – The Cal-EPA E&P Regulatory Reform Task Force formed a Roadmix Working Group to respond to the recommendation. The group's objective was to find the best approach for regulatory oversight of the industry's practice of reusing crude oil tank bottoms and similar substances as road paving materials, commonly referred to as "road mix". The Working Group included representatives from the DOGGR, Western States Petroleum Association, CalResources, McFarland Energy, Chevron, the SWRCB, Central Valley RWQCB, DTSC, IWMB, San Joaquin Valley Unified Air Pollution Control District, and the Air Resources Board (CARB).

The working group met over a two-year period and developed short- and long-range plans. The first goal of the working group was to determine the appropriate regulatory oversight for roadmix application in the San Joaquin Valley. The minimum oversight requirements for the waste, water, and air agencies were assessed next. A report was produced that serves as a basis to determine where roadmix may be used.

SWRCB – Regions 3 and 5 have dealt with this issue, without the involvement of other agencies. Region 5 Fresno has had no adverse impacts to water quality as a result of the application of off-spec road mix.

FOLLOW-UP REVIEW FINDING I.14

This recommendation has been met in Region 5. See further discussion under Finding and Recommendation VI.12, below.

INITIAL REVIEW FINDING I.15.

While the Chapter 15 SWRCB rules provide procedural requirements for the closure of these pits, there is no consistent policy in place regarding how the production pits should be closed.

INITIAL REVIEW RECOMMENDATION I.15.

The relevant RWQCBs should develop a consistent policy governing the closure of production pits. (See also Section VI of this report.) IOGCC Guidance section 4.4.

CALIFORNIA RESPONSE:

SWRCB – Within Region 5 Fresno, the BLM closure guidelines have been applied by industry with relative success in reducing the number of sources of wastewater surface disposal that threaten the waters of the state.

FOLLOW-UP REVIEW FINDING I.15

Region 5 RWQCB has met the recommendation by informally adopting BLM standards, while Region 3 RWQCB has not. Region 5 has not formally adopted the BLM standards for a variety of reasons, including lack of flexibility to address individual site differences and inability of small operators to subsume the costs. However, the door is still open to formal adoption of the BLM standards in Region 5. In Region 3, in Santa Barbara County most pit closures are handled by the County Fire Department Protective Services Division (PSD); in the other counties in the region the RWQCB is the lead agency. In those counties there are abandoned sumps on private property, but there is very limited funding to address them. Region 3 is currently in the process of inventorying these sites, some of which pose a threat to water quality.

FOLLOW-UP REVIEW RECOMMENDATION I.15

The team recommends that both Region 3 and Region 5 formally adopt the BLM standards for pit closure or develop their own pit/sump closure guidelines. (Guidelines 3.1.a, b, d, and e, and 4.4).

INITIAL REVIEW FINDING III.1.

DOGGR is currently revisiting its pit rules, and the revisions being considered include siting restrictions. Simultaneously, the SWRCB is reviewing siting issues for mud pits that are exempt from regulation under Chapter 15. DOGGR and SWRCB are consulting and coordinating with one another in these efforts.

INITIAL REVIEW RECOMMENDATION III.1.

The review team encourages these efforts and urges DOGGR and SWRCB to address pit siting issues such as fluid makeup; depth to and quality of groundwater; floodplains; wetlands; surface contours; and proximity to drinking water supplies and wells, surface water, residential or commercial buildings, geologic hazards, or other environmentally sensitive areas. IOGCC Guidance section 5.3.3.

CALIFORNIA RESPONSE:

SWRCB – The SWRCB is the primary regulatory authority for pits but has not established minimum standards for exempt Chapter 15 pits because it has been shown that they are not a significant threat to groundwater. The DOGGR does not wish to pursue overlapping regulations.

FOLLOW-UP REVIEW FINDING III.1

The objective of this recommendation has been met. The DOGGR and RWQCBs have evaluated the need for further regulations pertaining to pit siting issues. Based on their evaluation they decided no further regulation was necessary. See also the discussion of technical criteria for pits, below.

INITIAL REVIEW FINDING VI.4

Technical criteria for mud and workover pit construction and operation are lacking.

INITIAL REVIEW RECOMMENDATION VI.4.

The review team recommends DOGGR establish minimum standards for the construction and operation of mud and workover pits exempt from Chapter 15 requirements, including inspection requirements. The team understands DOGGR and SWRCB are developing rules to address these issues, and endorses these activities. IOGCC Guidance section 5.1.a and 5.1.c.

CALIFORNIA RESPONSE:

DOGGR – Section 1779 of CCR provides the DOGGR with broad powers to establish additional requirements for facilities or operations under its jurisdiction.

FOLLOW-UP REVIEW FINDING VI.4

This recommendation has not been met. The state has specific technical criteria in place for construction of the following types of pits: reserve pits, production pits (which would include skimming and settling pits), produced water pits, evaporation pits, blowdown pits, flare pits, emergency pits and workover pits. However, siting and operational criteria for reserve (mud) and workover pits are lacking.

FOLLOW-UP REVIEW RECOMMENDATION VI.4

The review team believes the construction criteria for the above listed pits are adequate. The State should develop criteria for siting and operation of reserve and workover pits. (Guidelines 5.1.a and 5.1.c).

INITIAL REVIEW FINDING VI.9.

There are no consistent RWQCB requirements for E&P waste facilities.

INITIAL REVIEW RECOMMENDATION VI.9.

The RWQCBs should develop consistent technical criteria for similar waste stream and site conditions. IOGCC Guidance section 5.3.6.

CALIFORNIA RESPONSE:

SWRCB – The RWQCB soil disposal workgroup developed recommendations. However, because the recommendations are not in regulation RWQCB’s must take individual actions.

FOLLOW-UP REVIEW FINDING VI.9

This recommendation has not been met. However, E&P waste facilities are subject to numerous State and local regulations including regulations pertaining to air impacts, land surface impacts, impacts to water and impacts to groundwater. They are also subject to local zoning ordinances regulating where and how they can be constructed. Because of the site specific nature of E&P waste facilities and unique nature of most waste streams the review team believes the development of uniform RWQCB requirements is not necessary.

INITIAL REVIEW FINDING VI.10.

There are no established time limits for mud and workover pits regulated by DOGGR, although, their informal policy is to require closure within 30 days of completion of work.

INITIAL REVIEW RECOMMENDATION VI.10.

The team recommends DOGGR formalize its closure policy in order to meet IOGCC Guidelines. IOGCC Guidance section 5.3.6.b.

CALIFORNIA RESPONSE:

DOGGR – The Division has no formal time frame for closure of pits, other than within 60 days of plugging and abandonment of an associated well. This issue has not been a problem because most operators close pits quickly to obtain release of drilling bonds. Also, many local land-use agency permits have time constraints.

FOLLOW-UP REVIEW FINDING VI.10

This recommendation is generally met in practice. Closure of pits in many areas of the state is regulated by local agencies, such as the county or city, and on federal lands by the BLM. In those areas of the state where pit closures are not otherwise regulated most operators close pits quickly in order to obtain release of their drilling bonds. DOGGR reports that pit closures are not a problem.

FOLLOW-UP REVIEW RECOMMENDATION VI.10

The team recommends the DOGGR adopt regulations establishing specific requirements for pit closure consistent with Guideline 5.5.5.b.

INITIAL REVIEW FINDING VI.11.

There are no requirements for an operator to submit analyses of mud pit and workover pit residuals left in earthen pits to DOGGR. Operators are required to analyze representative samples, and self-certify that the pit contents are nonhazardous and do not contain halogenated solvents.

INITIAL REVIEW RECOMMENDATION VI.11.

The team recommends the pending DOGGR pit rule revisions address representative sampling requirements for pH, organic content, salinity, hydrogen sulfide content, and ignitability. IOGCC Guidance section 5.1.f.

CALIFORNIA RESPONSE:

DOGGR – Although the **DOGGR** has the authority to request the sampling of pits for content identification, the **DOGGR** regulations specifically require pit operators to comply with **SWRCB** requirements for the testing, management, and closure of pits.

FOLLOW-UP REVIEW FINDING VI.11

The objectives of this recommendation have been met by **SWRCB** requirements. Although the **DOGGR** has not established requirements for the testing of mud and workover pit residuals, the **SWRCB** has established such requirements. They require the operator to analyze representative samples to ensure they are non-hazardous under California testing criteria and that they do not contain halogenated organics. The current state requirements are consistent with Guideline 5.5.5.c.

INITIAL REVIEW FINDING VI.12.

A consistent policy for landspreading, roadspreading, and roadmixing of E&P wastes is needed across all affected agencies.

INITIAL REVIEW RECOMMENDATION VI.12.

The review team recommends RWQCBs, DTSC, DOGGR, and APCDs develop a landspreading and roadspreading/roadmix policy and enforcement mechanism. Such a policy should require representative material analysis and appropriate operational controls. Use of maps to track roadspreading and roadmix applications is a good idea. IOGCC Guidance sections 5.4. and 5.6. FINDING VIII.1.

CALIFORNIA RESPONSE:

DOGGR – See response to **RECOMMENDATION I.14.**

SWRCB – The Regions have attempted to develop guidelines. Region 3 is unaware of any Cal-EPA activity related to this recommendation. Region 5 requires sampling and material analysis and other information regarding requests for roadmixing.

FOLLOW-UP REVIEW FINDING VI.12

This recommendation has been met. The Cal-EPA E&P Regulatory Reform Task Force formed a Roadmix Working Group which developed guidelines for the use of hydrocarbon bearing materials (such as tank bottoms and soils) as roadmix. The review team commends the joint agency/industry task force for development of the roadmix guidelines. The roadmix guidelines have been adopted in Region 5. Landspreading of any E&P wastes and roadspreading of any material other than that which meets the requirements of roadmix is subject to RWQCB WDR requirements.

FOLLOW-UP REVIEW RECOMMENDATION VI.12

The Team encourages the **SWRCB** to consider adopting the roadmix guidelines state-wide, with flexibility to address regional conditions. (Guideline 5.8.1).

Supplemental Review Findings and Recommendations**GUIDELINE 5.1 – General**

- e. *Siting Criteria (New subsection)*
- i. *States should incorporate siting requirements in statewide rules for pits, landspreading, landfilling and burial, and waste reclamation facilities. Areawide rules or site-specific permits may contain additional siting conditions.*

- ii. *No E&P waste management facility should be located in a flowing or intermittent stream.*
- iii. *Where necessary to protect human health, new E&P waste management facilities should not be located in close proximity to existing residences, schools, hospitals or commercial buildings. The need for minimum distance criteria from residences or other buildings to the boundary of E&P waste management facilities should be considered.*
- iv. *Generally, applicable siting requirements should address such factors as depth to and quality of groundwater, wetlands, floodplains, topography, proximity to existing drinking water supplies and wells, geology, geologic hazards, and other environmentally sensitive areas.*
- v. *Siting of E&P waste management facilities should be consistent with applicable land-use requirements.*

SUPPLEMENTAL REVIEW FINDING III.1

In addition to the oversight provided by the DOGGR and SWRCB, other state and regional agencies also regulate the siting of E&P waste management facilities including the Department of Toxic Substances Control (DTSC) and the Integrated Waste Management Board (IWMB) at the state level, air pollution control districts (APCD) at the regional level, and local planning agencies. Few distinctions are made between onsite, offsite and commercial facilities used to manage E&P wastes.

The review team finds the siting of E&P waste management facilities in California generally meets the requirements of Guideline 5.1

5.2 WASTE CHARACTERIZATION (New section)

GUIDELINE 5.2.1 - Purposes

Waste characterization should support at least the following functions of a state's E&P waste management program:

- a. *ensuring E&P waste management practices are suited to the particular wastes involved and in compliance with applicable program requirements; and*
- b. *ensuring commercial E&P waste facilities are managing only wastes they are authorized to handle.*

GUIDELINE 5.2.2 – Sampling and Analysis

- a. *State waste characterization requirements should include appropriate testing of E&P wastes prior to disposal for such characteristics as organic content, pH, salinity, and sulfur compounds, including hydrogen sulfide content. Testing must be appropriate for the type of waste, method of disposal, and the potential for adverse health and environmental effects. In addition, while nothing in these criteria mandates testing for every hazardous constituent in E&P wastes, it is recognized that waste management practices and regulatory requirements would be improved by obtaining a more complete knowledge, through sampling and analysis, of the range of hazardous and toxic constituents in E&P wastes. Accordingly, waste characterization requirements should provide data necessary to meet the purposes of waste characterization described in section 5.2.1 and to administer and enforce state program requirements effectively.*
- b. *State requirements for the assessment of E&P wastes for Naturally Occurring Radioactive Material (NORM) should meet the criteria of this section and of sections 7.3.3. and 7.3.9. Such requirements should address all types of radiation expected in E&P wastes.*
- c. *These guidelines do not address all the details of a waste characterization program, such as testing methods, frequencies, or parameters. The details are expected to vary depending*

upon the waste, the proposed management practice, and other state program requirements.

GUIDELINE 5.2.3 – Quality Control

- a. *State programs should contain provisions that any required waste sampling follow appropriate sampling procedures, and any required laboratory analysis be performed by qualified laboratories in order to produce valid and reliable results. A state may rely on field testing to satisfy waste characterization requirements where it can be determined that such testing will produce valid and reliable results.*
- b. *Testing methods should produce data that are valid for the purpose intended. For example, EPA's Toxicity Characteristic Leaching Procedure (TCLP) may not accurately predict the leachability of oily E&P wastes.*

SUPPLEMENTAL REVIEW FINDING III.2

E&P wastes in California are not necessarily exempt from the state hazardous waste regulations and are managed as hazardous if they exhibit one or more of the hazardous waste characteristics (ignitability, reactivity, corrosivity or toxicity) as defined by the DTSC. Disposal of NORM contaminated material is regulated by the Department of Health Services and when the waste is injected in a Class II well by DOGGR. The placement of all wastes on the ground is regulated by regional water quality control boards. UIC Class II wastes are regulated by DOGGR. Each agency establishes testing procedures as part of their permitting process for the disposal of wastes. The State program is consistent with Guideline 5.2. See also Follow-up Review Finding and Recommendation I.4 (p. 34).

GUIDELINE 5.3 – WASTE MANAGEMENT HIERARCHY

GUIDELINE 5.3.3 – State program elements

State programs should contain mechanisms to encourage waste management consistent with the hierarchy of this section. A variety of mechanisms may be used, such as:

- a. *Program requirements or policies that encourage source reduction and recycling;*
- b. *Improved training of state personnel so they can identify source reduction opportunities;*
- c. *Technical assistance or incentives to operators; and*
- d. *Educational activities aimed at informing facility operators of the options available.*

The waste management hierarchy should be integrated into the other elements of a state program. For example, spill and release prevention should be incorporated into facility management regulations. Similarly, state requirements should address the segregation of waste streams that have a higher pollution potential from those with a lower pollution potential. State information program elements should include a component related to hierarchy planning and implementation.

State program planning activities should include goals and objectives that provide for substantial progress in this area over a reasonable time. States should have sufficient information to evaluate whether the mechanisms used to encourage source reduction and recycling are achieving those goals and objectives. State program requirements should be reviewed for consistency with the waste management hierarchy and the established goals and objectives. State agencies should also coordinate their efforts with other agencies that are responsible for waste management.

SUPPLEMENTAL REVIEW FINDING IIL.3

See Supplemental Review Finding I.1 (p. 16).

SUPPLEMENTAL REVIEW RECOMMENDATION IIL.3

The state agencies should continue to explore mechanisms for encouraging waste management consistent with the hierarchy. They should also establish goals and objectives that provide for substantial progress in this area over a reasonable time. (Guideline 5.3.3.)

GUIDELINE 5.5 – TECHNICAL CRITERIA FOR PITS (Amended sections)

GUIDELINE 5.5.2.d, 5.5.2.e

.....

- d. *Construction and use of rule-authorized pits should require prior notification of the appropriate regulatory agency to ensure that proper construction, operation, and closure methods are used to protect human health and the environment.*
- e. *State programs should include provisions to accommodate approval of pits for emergency situations.*

SUPPLEMENTAL REVIEW FINDING IIL.4

In some areas of the state there is no requirement to notify an agency prior to the construction and operation of reserve, workover or emergency pits.

SUPPLEMENTAL REVIEW RECOMMENDATION IIL.4

The review team recommends DOGGR consider developing regulations requiring notification prior to the construction and operation of reserve, workover and emergency pits. (Guidelines 5.5.2.d., 5.5.2.e).

GUIDELINE 5.5.3

General standards for construction of pits should be included in area or statewide regulations and should address the following items:

- e. *Construction standards for pits may differ depending upon the wastes they receive, the length of time they are used, and site-specific conditions.*
- i. *The use of production pits is declining nationally because of concerns about potential contamination of air, soils, and groundwater. In many instances, equipment consolidation, process modifications, or tanks can be used in lieu of pits. The use of alternatives is generally encouraged. Where production pits are used, they should generally be lined, except as provided below in subsection 5.5.3.e.v.*
- ii. *In the case of reserve and workover pits, liners should be required in certain instances based upon fluid type and site-specific characteristics (e.g., unconsolidated soils and/or hydro-geologic conditions that create a potential for adverse impact to surface water or groundwater, and proximity to environmentally sensitive areas).*
- iii. *Special purpose pits and other pits such as dehydration, tank drain, pipeline drip collector, and compressor scrubber pits should be lined.*
- iv. *Blowdown, flare and emergency pits may be unlined where the removal requirement of section 5.5.4.k. will prevent adverse groundwater quality impacts.*
- v. *Variances to the above liner requirements should only be provided, and percolation pits should only be used, where it is clearly demonstrated there is minimal potential to affect adversely groundwater quality.*

vi. Liners can consist of natural or synthetic materials, should meet accepted engineering practices, and should be compatible with expected pit contents.

SUPPLEMENTAL REVIEW FINDING III.5

Pit construction is regulated jointly by DOGGR and the regional water boards. The California program meets the Guidelines for pit construction standards.

GUIDELINE 5.6 – TECHNICAL CRITERIA FOR LANDSPREADING (Amended sections)

GUIDELINE 5.6.1.a

- a. E&P wastes should be subject to loading rates, location restrictions, and/or other appropriate requirements that promote biodegradation of organic constituents; will not result in waste pooling, ponding, or runoff; will prevent the contamination of groundwater or surface waters; and will protect air quality.*

SUPPLEMENTAL REVIEW FINDING III.6

Landspreading operations are subject to the requirements of CCR Titles 23 and 27. All placement of E&P wastes on the ground for purposes of disposal requires issuance of a WDR by the RWQCB. In most areas of the state landspreading of E&P wastes would also be subject to county or city oversight. Local Air Pollution Control Districts (APCDs) regulate all sources of emissions, including hydrocarbon emissions for landspreading operations. The California program meets the Guidelines.

GUIDELINE 5.8 – TECHNICAL CRITERIA FOR ROADSPREADING (Amended sections)

GUIDELINE 5.8.1

Roadspreading is the placement on roads of E&P wastes that exhibit properties similar to commercial road oils, mixes, dust suppressants, or road compaction or deicing materials. Roadspreading of E&P wastes that do not exhibit such properties should be prohibited. Roadspreading of E&P wastes containing NORM above regulatory action levels should be prohibited.

SUPPLEMENTAL REVIEW FINDING III.7

The California program for roadspreading meets the Guideline requirements as outlined under Follow-up Review Finding and Recommendations VI.I2 (p. 39).

GUIDELINE 5.9 - TECHNICAL CRITERIA FOR TANKS (New section)

GUIDELINE 5.9.2 – General Requirements

- a. States should have information, where available, on the locations, use, capacity, age and construction materials (e.g., steel, fiberglass, etc.) of tanks as needed to administer and enforce state program requirements effectively. Such information may be obtained through registrations, inventories, or other appropriate means.*
- b. Tanks covered by this section should not be located in a flowing or intermittent stream and should be sited consistent with applicable local land-use requirements.*
- c. Tanks should be subject to spill-prevention, preventive maintenance and inspection requirements, including those of sections 5.3.1.c. and 5.3.3. of these guidelines.*

GUIDELINE 5.9.3 – Construction and Operation

- a. *A principal goal of construction and operation standards for tanks is to minimize the occurrence of and the environmental impacts from spills and leaks.*
 - i. *New tanks should be constructed in a manner that provides for corrosion protection consistent with the intended use of the tanks. All tanks covered by this section should be operated in a manner that provides for corrosion protection consistent with the use of the tanks.*
 - ii. *Tanks should exhibit structural integrity consistent with their intended use. Wooden tanks should receive increased scrutiny in this regard.*
 - iii. *Tanks should be operated in a manner that protects against overtopping.*
 - iv. *Secondary containment systems or other appropriate means, such as leak detection, should be employed to minimize environmental impacts in the event of releases.*
- b. *Covered tanks are preferred to open tanks. Open E&P waste and product tanks should be equipped to protect migratory birds and other wildlife in a manner consistent with the wildlife-protection criterion of section 5.5.3.f.*
- c. *Tanks located in populated areas where emissions of hydrogen sulfide can be expected should be equipped with appropriate warning devices.*

GUIDELINE 5.9.4 –Tank Removal and Closure

- a. *Tanks should be emptied prior to their retirement and the resulting materials should be managed properly.*
- b. *Tanks and associated above ground equipment should be removed upon cessation of operations. For good cause, a state may allow tanks to be removed as soon as practical thereafter. Site reclamation should meet all landowner and lease obligations and any other applicable requirements.*
- c. *Prior to removal, closure, or release for unrestricted use, tanks and associated piping and equipment should be surveyed for NORM as provided for in Sec.7. When regulatory action levels are exceeded, NORM and the equipment containing NORM should be managed in accordance with the state's NORM regulatory program (see Section 7 of these guidelines).*

SUPPLEMENTAL REVIEW FINDING III.8

Local air districts have completed inventories of E&P waste tanks containing materials that emit VOCs. DOGGR has adopted regulations for secondary containment, leak detection, and periodic inspection and has completed an inventory of tanks. Local emergency response agencies have location and inventory information for all tanks containing listed hazardous substances including hydrocarbons and other E&P wastes. Local APCD regulations address the potential emissions of H₂S. (Guideline 5.9.3.c.) The extent to which California specifically regulates construction and operation of all E&P waste tanks is unclear. The combination of state and local agency oversight of E&P waste tanks meets the requirements of Guidelines 5.9.2.b and c.

SUPPLEMENTAL REVIEW RECOMMENDATION III.8

The review team recommends that DOGGR evaluate the need for further regulation of tank construction and operation, and the need to acquire information on the location, use, capacity, age and construction materials of E&P waste tanks. See Guidelines 5.9.2.a and 5.9.3.

GUIDELINE 5.10 – TECHNICAL CRITERIA FOR COMMERCIAL AND CENTRALIZED DISPOSAL FACILITIES (Amended sections)

GUIDELINE 5.10.2.2.d

d. *Operating Plan The need for groundwater, air, or other monitoring at commercial or centralized disposal facilities where wastes are placed on the land should be evaluated by the state as part of this program development and implementation, and should depend upon the nature and size of the disposal activities. At facilities that manage oil-field NORM, monitoring should be sufficient to determine compliance with maximum permissible doses to workers and to members of the public in unrestricted areas. The Operating Plan should contain the following information:*

iii..... At commercial and centralized facilities where wastes are placed on the land, such as in pits or landfarms, groundwater monitoring should be required in the absence of site-specific or facility-specific conditions that minimize the potential for adverse impacts to groundwater. Specific plans for preventing or minimizing air emissions from sources such as (1) the volatilization of organic materials in the waste; (2) particulate matter (dust) carried by the wind; and (3) chemical reactions (e.g., production of hydrogen sulfide from sulfur-bearing wastes) should be considered. ...

ix. A community relations or public information plan should be considered; and

x. Environmental, Health, and Safety Plan. Where applicable, an environmental, health, and safety plan should be developed for commercial disposal facilities. Such plan should describe site sampling methods and procedures to determine the potential risks to human health and the environment posed by the site. State regulatory programs should take into consideration the size and nature (treatment and disposal processes) of each facility when determining whether or not this environmental, health, and safety plan is applicable.

SUPPLEMENTAL REVIEW FINDING III.9

The state program to permit commercial Class II injection sites and E&P waste management facilities meets the siting requirements of Guideline 5.10.2.2.d.

GUIDELINE 5.10.2.2 e ii

e..... ii. For commercial disposal facilities and centralized disposal facilities of comparable nature or size, the plan should describe the site sampling methods that will be used to determine the risks to human health and the environment posed by the site, if any, once closure is completed; and any further measures that may be necessary to address the remaining site contamination at that time. The plan should also include post-closure monitoring and maintenance requirements where the wastes remaining on-site after closure may adversely affect groundwater or surface waters or otherwise pose a risk to human health and the environment. The duration of the post-closure care period and the nature of the post-closure requirements should correspond to the continuing risks posed by the facility after closure.

GUIDELINE 5.10.2.3

To assure that only acceptable wastes are disposed of at commercial or centralized facilities, a waste tracking system that documents the movement of wastes from the site of their origin to their

final disposition should be implemented. The following elements should be included in the waste tracking system:

c. Attest to No Illegal Dumping:The disposal facility operator should certify in writing that the facility is authorized to receive the waste for disposal.

SUPPLEMENTAL REVIEW FINDING III.10

No state agency requires the centralized/commercial facility operator to certify in writing that the facility is authorized to receive the waste for disposal.

SUPPLEMENTAL REVIEW RECOMMENDATION III.10

The appropriate agency or agencies of the State of California should meet the requirements of section 5.10.2.3.c of the Guidelines. See also Follow-up Finding and Recommendation VII.2 (p. 29).

IV. Abandoned Sites (Guideline Section 6 – All New)

Follow-up to Initial Review Recommendations

INITIAL REVIEW FINDING I.24.

While \$350,000 per year is a substantial sum for an abandoned well program and is a positive feature of DOGGR's program, additional resources will be required to complete the plugging program within a reasonable time frame.

INITIAL REVIEW RECOMMENDATION I.24.

Although outside the scope of the IOGCC Guidelines, DOGGR should obtain the necessary resources to complete the plugging program within a reasonable time frame.

CALIFORNIA RESPONSE:

DOGGR – Since the peer review, the DOGGR worked for and received authority to increase the yearly plugging and abandonment fund. In 1994, the fund increased from \$350,000 to \$500,000. In 1998, the annual funding amount increased to \$1 million, for a 5-year duration.

Also, the Division organized an orphaned/idle well committee, comprised of industry, DOGGR, and BLM representatives. The committee has been very proactive in developing new legislation that should reduce significantly the number of orphaned wells in the state.

FOLLOW-UP REVIEW FINDING I.24

Although outside the scope of the initial review, this recommendation has been met under the current Guidelines.

Supplemental Review Findings and Recommendations

GUIDELINE 6.1 – ABANDONED OIL AND GAS SITES INTRODUCTION

States with current or historic oil and gas operations should develop and implement a program to inventory, prioritize, and remediate, as necessary, abandoned sites. The purpose of this section is to provide guidance for that program. It is not the intent of these Guidelines to preclude an abandoned site from being returned to operation in accordance with state requirements.

DISCUSSION

California has developed and implemented a program to inventory, prioritize, and plug, as necessary idle and orphaned wells. DOGGR has responsibility for idle and orphaned wells and abandoned sites associated with wells. The RWQCBs have responsibility for abandoned sites that have the potential to impacts water quality. DOGGR determined that it needed to enhance its idle and orphaned well programs because of increased well or environmental damage, an increased number of orphaned wells, and a plugging liability of about \$7 million. Increases resulted from economic downturns, oil company reorganizations, and at times permissive state laws. For instance, there were 20,732 wells idle 5 years or longer in 1997 up from 12,043 in 1983; 11,222 wells idle 10 years or longer in 1997 up from 8,778 in 1988; yet 4,984 wells idle 15 years or longer in 1997 down from 5,061 in 1991. There are a total of 700 plus wells that are orphaned wells. DOGGR would need 10 years to complete its program if no new wells are added. DOGGR is now, and has been for some time, aggressively identifying idle wells and plugging orphaned wells.

DOGGR's three sources of funding for plugging wells are bonds (an operator may be defunct, but a bond may still be in force), the hazardous and idle-deserted well fund (currently set at \$1 million), and the special fund which is derived from the idle well fees collected by the DOGGR. These funding mechanisms may be used to plug hazardous and idle-deserted wells or orphaned wells.

SUPPLEMENTAL REVIEW FINDING IV.1

The Review Team was very pleased with DOGGR's overall idle and orphaned well program. The RWQCBs have no comparable program, however, for abandoned sites not associated with a well, including pits and sumps.

SUPPLEMENTAL REVIEW RECOMMENDATION IV.1

The Review Team recommends that the RWQCBs, in coordination with local agencies, identify a process to develop a statewide inventory of abandoned sites. The state should also develop a funding mechanism to allow RWQCBs to promptly remediate abandoned sites. When an abandoned sites program is established, a system for setting goals and prioritizing remediation should be developed. The program should include remediation standards that minimize or remove the threat to public health and the environment and that restore the land to an appropriate condition.

GUIDELINE 6.2 - DEFINITIONS

The terms "Oil and Gas Site" and "Abandoned Site," as used herein, have the following meanings:

- a. An Oil and Gas Site is land or equipment, including a wellbore, that is now or has been used primarily for oil or gas exploration or production, or for the management of oil and gas wastes from exploration and production.*
- b. An Oil and Gas Site is considered an Abandoned Site if the site:*
 - i. Was not adequately plugged or closed at conclusion of operations such that it constitutes or may constitute a threat to public health or the environment; and*
 - ii. Has no owner, operator, or other responsible person (hereinafter called "responsible party") who can be located, or such responsible party has failed or refused to undertake actions, where required by law, to abate the threat. A responsible party cannot be located, among other circumstances, where no liability for remedial actions is imposed by the state upon past or current owners and operators.*

DISCUSSION

Definitions are contained in Sections 3237, 3250, 3251, and 3251.5 of the PRC. Removal and disposal of tanks, pipelines, and other attendant facilities may be included in the idle and orphaned well program as well.

An idle well is defined as any well that has not produced or injected for 6 consecutive months of continuous operation during the last five years. A long-term idle well is defined as any well that has not produced or injected for six consecutive months of continuous operation during the last 10 or more years. An orphaned well is a well that has no viable operator or owner.

SUPPLEMENTAL REVIEW FINDING IV.2

Definitions are clear and fully described in statute in accordance with Guideline 6.2.

GUIDELINE 6.3 - IDENTIFICATION OF ABANDONED SITES

A state should have a procedure for identifying sites which may constitute a threat to public health or the environment and for determining whether a responsible party exists. The state should develop and maintain an inventory of abandoned sites. Examples of elements that may be considered in identifying sites which may constitute a threat to public health or the environment include agency reviews or inspections, referrals by other agencies, or citizen or landowner inquiries. Classifications or rankings may be used to separate these sites into relative risk categories. Examples of elements that may be considered in determining whether a responsible party exists include the failure to file required data or reports, the failure to respond to agency inquiries, tax defaults, information in public records, or landowner or public inquiries. In developing an inventory of abandoned sites, the state should have procedures for attempting to notify the last known responsible party, and providing legal notice.

Emergency protocols should be included, so that remedial action can be initiated prior to legal notice on sites that are judged to present an immediate threat to the public health or environment. Where there are agencies with overlapping jurisdiction for abandoned sites, inventory procedures should be coordinated among these agencies as further discussed in section 4.4. of these guidelines.

DISCUSSION

DOGGR has a thorough procedure for identifying sites that may constitute a threat to public health and safety or the environment, and for determining whether a responsible party exists. To track the number of idle and orphaned wells in the state, the DOGGR has developed and maintains an inventory of idle and orphaned wells, which may be downloaded from the DOGGR web page. DOGGR determines the following quantities of wells and well types from the monthly Well Production and Injection Reports: # of wells operated, # of idle wells, # of long-term idle wells (both 10-year and 15-year inventories), and # of observation wells. When a new well is identified, it is prioritized into the list. DOGGR also responds to all referrals by other agencies and citizen complaints. Procedures are in place for attempting to notify the last known responsible party, and providing legal notice. In cases where there may be overlapping jurisdictions, agency activities are coordinated and emergency protocols are in place if instant remedial action is required.

However, the RWQCBs do not appear to maintain an inventory of abandoned sites not associated with wells. During the 70's and again in the 80's, the DOGGR and the Department of Fish and Game inventoried all hazardous sumps (those that pose a threat to the environment and public) and then remediated or closed the sumps. In addition, DOGGR has recorded every visible sump located in oilfields. The oilfield areas have been canvassed using over flights and field inspectors. However, the Region 3 RWQCB expressed concern over the potential numbers of abandoned sites not associated with wells. Often abandoned sites are found when a property is being sold for development purposes and undergoes detailed review of past and present practices as part of an environmental review. The actual buyer and seller often agree to remediate the site.

In large part, landowners bear the primary responsibility for identifying and remediating abandoned sites not associated with wells. When development projects are proposed to local governments, those local governments often forward the proposals to DOGGR for its review to determine whether oil and gas operations existed on the development site. In addition, developers may employ firms to perform environmental assessments of properties before undertaking new projects. As indicated by RWQCB staff during the in-state reviews, these procedures are not always effective due to incomplete records, and development sometimes occurs on unremediated abandoned sites. Unremediated abandoned sites may present a problem in California since urban development is spreading into former production areas.

SUPPLEMENTAL REVIEW FINDING IV.3

There does not appear to be a specific inventory of abandoned sites not associated with wells, although some effort is being made in the central coastal region by DOGGR and RWQCB Region 3 to develop an air photo library as a means of identifying abandoned sites.

SUPPLEMENTAL REVIEW RECOMMENDATION IV.3

The local agency may wish to consider requiring the identification of a well or site as part of property deeds. See also Supplemental Review Recommendation IV.1 (p. 48).

GUIDELINE 6.4 - FUNDING FOR ABANDONED SITE REMEDIATION

An effective state program to address abandoned sites should have adequate funds available to permit the state to undertake any necessary assessment, plugging, closure, or remediation of such sites.

Adequate funding involves the development of a financial assurance program as provided in section 4.2.4. To ensure the continuity of financial assurance in the event of a change of operator, notice to the state of any such change should be required. Any financial assurance provided by the previous operator should remain in effect until the new operator's compliance with the state's financial assurance program is verified.

Section 4.2.4. describes some of the types of financial assurance a state should consider in designing a program to provide it with the necessary economic resources while facilitating operator compliance. As part of a financial assurance program, a state should consider establishing a special purpose fund to plug, close, or remediate an abandoned site. The state should have the authority to recover costs from the responsible party, where such party exists. The state should evaluate its needs and establish such funding mechanisms as are appropriate to satisfy those needs. A wide variety of funding mechanisms have been employed to support existing special purpose funds in various states. Those mechanisms include bond forfeitures; legislative appropriations to the responsible state agency; a percentage of the taxes on oil and gas production; fines and penalty assessments; equipment salvage; and a host of fees, among them fees or charges based on the value of oil and gas, fees or charges based on units of production of oil and gas, operator fees, supplemental fees in lieu of bonds, inactive well fees, permit fees, and waste generation fees.

DISCUSSION

In 1976, DOGGR was given authority to plug certain hazardous and idle-deserted wells (Article 4.2 of the PRC). Most of the wells that fall into this category are orphaned wells. From 1977 to 2002, the DOGGR plugged 768 wells at a total cost of \$10.9 million. The average cost to plug a well is about \$20,000. In the 1990's, well bonding requirements had become insufficient to provide for the DOGGR to plug orphaned wells.

Two pieces of legislation were passed to enhance DOGGR's ability to plug wells and ensure wells were addressed appropriately in the future: SB2007, effective January 1, 1997, and most importantly SB1763, effective January 1, 1999. These pieces of legislation increased industry commitment to manage idle wells and assume a defined responsibility for idle wells, and made changes in the PRC on definitions, bonds, acquisition of idle wells, and idle well requirements, and increased.

Previously, where no operator could be located and the DOGGR had determined a well to be orphaned, statute identified a \$500,000 fund for the DOGGR to access in contracting for the

plugging. In 1994, the Legislature had approved an increase from \$350,000 to \$500,000. The 1998 legislation increased the annual funding amount the DOGGR can spend for the plugging of orphaned wells from \$500,000 to \$1 million for 5 years (Section 3258). After five years, a Report to the Legislature must be prepared to describe the progress made in plugging orphaned wells and recommend any funding needs.

DOGGR has acknowledged that the inventory of orphaned wells is increasing in spite of the plugging progress. When the plugging fund for orphaned wells was increased from \$500,000 to \$1,000,000 in 1998, the state had 630 orphaned wells. Today, the State has almost 900 orphaned wells. Although DOGGR is plugging 65 to 85 wells per year, the number of wells orphaned each year continues to grow.

A list of prospective well abandonment contractors is maintained and companies on this list are sent bid packages when their services are needed by DOGGR to plug wells. The contract goes to lowest responsible bidder and salvaged equipment credit can offset costs.

In addition, the SWRCB maintains a State Water Cleanup and Abatement Account, which it can access to address abandoned pits and other E&P waste sites when a responsible party cannot be found. In the case of a hazardous surface condition, U.S.EPA may be requested to join DOGGR by paying for the surface clean up while DOGGR pays for the well plugging.

The 1998 legislation also allowed the DOGGR to increase drilling bond amounts by \$5,000. Individual well bonds increased to \$15,000 for wells less than 5,000 feet in depth; \$20,000 for wells between 5,000 and 10,000 feet; and \$30,000 for wells in excess of 10,000 feet. The basis for this 1998 change was that plugging costs for a well had increased. The previous rates were established in statute in 1976. A drilling bond may be released after 6 months of continuous production.

The DOGGR has a program to reduce the number of idle wells by encouraging operators to reactivate or plug and abandon their idle wells. Several options are provided for operators to cover the liability of their long-term idle wells. First, an operator could take out a \$1 million blanket bond to cover all their operations, blanket performance bonds of \$100,000 if less than 50 wells, or \$250,000 if greater than 50 wells, or \$100,000 cash blanket bonds for greater than 50 wells increased \$30,000/year for 5 years. Second, operators could choose to pay the annual idle-well fee, but on an increased scale reflecting relative hazards: for wells idle less than 10 years the fee is \$100; for wells idle 10-15 years the fee is \$250; and for wells idle for over 15 years, the fee is \$500. Third, operators may take out a \$5,000 bond for each individual idle well; fourth, operators may establish an escrow account for each idle well that must be worth \$5,000 after 10 years (any interest earned in the escrow account will be returned to the operator and the money is released when well is plugged or returned to service); and fifth, operators may establish an idle well management plan that requires operators to eliminate a certain percentage of long-term idle wells (10 years or longer) on an annual basis. For purposes of the plan, eliminate means to return to production, plug and abandon (clean-up), or turn that well into an injection or observation well.

An operator choosing the plan option would not be subject to any additional idle well fees or bonding requirements. If the operator failed to meet its annual goals for plan implementation, the operator would immediately be required to secure idle well bonds or establish an escrow account for the wells.

SUPPLEMENTAL REVIEW FINDING IV.4

The State presently has adequate funds to cover orphaned well plugging. However, the State does not have a process for RWQCBs to easily obtain funds to remediate abandoned sites not associated

with wells. Continuing the success of the orphaned well program may require additional financial resources. Although DOGGR has an aggressive orphaned well plugging program, targets are not being met as a result of particular wells requiring more funds than expected, slowing down the number of wells being plugged.

SUPPLEMENTAL REVIEW RECOMMENDATION IV.4

The Review Team recommends that DOGGR evaluate the need to extend the \$1 million fund for plugging orphaned wells to an appropriate time in the future. The Team recommends that DOGGR evaluate its orphaned well performance targets and adjust them accordingly. DOGGR should also evaluate the causes of newly inventoried orphaned wells to determine whether new regulation is necessary to prevent wells from becoming orphaned. Even given the adjustments, the team is pleased with the progress made since the last review. The Team also recommends continuing good coordination with the federal BLM, which provides support and bonds for orphaned wells.

The State should also develop a funding mechanism to allow RWQCBs to promptly remediate abandoned sites. When an abandoned sites program is established, a system for prioritizing remediation should be developed.

GUIDELINE 6.5 - CRITERIA FOR PRIORITIZING REMEDIATION

The state program should include criteria for determining whether an abandoned site constitutes a threat to public health or the environment and the site's priority for remediation. Among other things, the following criteria may be used: (1) the occurrence of or potential for an imminent release from the site; (2) the nature, extent, and degree of contamination; (3) the proximity of the site to populated areas, surface water, and/or groundwater; (4) whether the site is in an environmentally sensitive area; and (5) wellbore lithology and condition. Where appropriate, the state should perform a more detailed site evaluation. The state agency should have flexibility and discretion to consider the factors associated with the individual sites, including cost savings associated with simultaneous remediation of multiple sites that otherwise would have different priorities or similar financial considerations, in assigning them a priority on the inventory of abandoned sites.

DISCUSSION

DOGGR prioritizes plugging taking under consideration sites that constitute a threat to public health or the environment, the occurrence or potential of release from the site, the degree of contamination, any environmental sensitivities or proximity to populated areas.

Wells that require formal action fall into two general categories: (a) damaging (section 3224, PRC) or deserted wells (Section 3237, PRC); and (b) hazardous or idle-deserted wells (sections 3250-3259, PRC). These wells may be either unbonded or bonded in varying amounts. The procedures for handling these two categories of wells differ slightly.

The DOGGR requires operators to file monthly electronic or hardcopy reports on well production and/or injection that are entered into the data management system (WellStat). Information available includes a list of all active production and injection wells, idle wells, volume injected, pressure, days producing or injecting, shut in, and the source of fluid (production records tell amount of fluid and disposition). The information is posted monthly on the DOGGR's web page and printed in the Annual Report.

Wells that are deemed hazardous have the highest priority for being plugged. These are followed by wells that are still bonded. The next priority is deserted wells the district deems necessary to

plug, pending available funding. In 2001, the DOGGR spent \$850,000 to plug oil and gas wells of defunct operators.

SUPPLEMENTAL REVIEW FINDING IV.5

DOGGR's system for prioritizing well plugging meets the Guidelines requirements.

GUIDELINE 6.5.1 - GOAL FOR REMEDIATION

A goal of the state program should be to remediate the abandoned sites on its inventory in a manner which assures that reasonable and measurable progress is made.

DISCUSSION

DOGGR's program goal is to reduce California's orphaned well inventory and its current and potential well plugging financial and environmental liability through adequate financial assurances from California's long-term idle wells. In this manner, the state's resources and environment are protected from harm.

The object of the DOGGR's idle-well program is to elevate an operator's awareness of its idle-well inventory and return to production such wells or plug any idle wells that have no apparent future use. If the operator does not have specific plans for the well or wells, does not respond to DOGGR inquiries, has wells located in unstable terrain, or has junked holes, the wells are ordered plugged and abandoned.

Despite the DOGGR's idle well program and higher bonding levels to increase operator responsibility, a number of orphaned wells still remain.

DOGGR has set performance measurements to track progress against identified goals. Performance targets were 8% of the 630-well inventory in 1999, 24% in 2000, and 40% in 2001. At the time of the review, DOGGR was working on 25 wells and anticipating work on 33 more, totaling 58 in 2002. The target for 2002 is 56% (353 of 630), and actual performance at the end of 2002 is projected to be 42%.

Although DOGGR is below its target goals, there are legitimate reasons for the delay in reaching program goals including a contract overrun on a problem well; unanticipated emergency lease clean-up; budget uncertainties; and higher average well-plugging costs.

SUPPLEMENTAL REVIEW FINDING IV.6

DOGGR has identified plugging goals and has made significant progress in the plugging and management of idle and orphaned wells in all aspects. DOGGR has met the Guideline standard.

GUIDELINE 6.5.2 - LIABILITY FOR REMEDIATION

The state should establish a liability scheme that will ensure that the goals of its abandoned sites program will be achieved. States should consider a range of options with respect to liability for remediation, which may include among others: (1) liability for all current and past owner(s) and operator(s); (2) liability for the owner(s) and operators(s) found to be responsible for the contamination at an abandoned site; or (3) no liability for past or current owner(s) and operator(s) should the state choose to finance the abandoned sites program.

Any liability scheme established by a state should clearly define the responsibility for remediation. A state should allow remediation of an abandoned site by a party which would not otherwise be responsible for the remediation.

DISCUSSION

DOGGR has a liability scheme that clearly defines the responsibility for plugging.

The State's potential future liability for oil and gas wells is decreased by increased oil and gas well financial assurance requirements, a defined chain of responsibility for transferred wells, and incentives for an operator to rework an orphaned well in an attempt to regain production.

DOGGR maintains a list of orphaned wells that are available for adoption under the "adopt a well" program. The well list may be downloaded from the DOGGR web page. This program allows prospective operators to enter into a three-way agreement with DOGGR and the mineral owner to test an orphaned well for up to 90 days without incurring the liability for plugging the well or having to post a bond. If the test is successful, the prospective operator can adopt the well by posting a bond and become its permanent operator. An idle well that is put back into production gets a 10-year abatement of the "assessment." If the test is unsuccessful, the prospective operator can walk away from the agreement with no liability incurred.

Various circumstances including, failure of an operator to comply with the idle-well provisions of the PRC constitute conclusive evidence of well desertion and DOGGR may order deserted wells plugged (Sections 3206 and 3237). DOGGR has been successful with ensuring operator responsibility by expanding the definition of "credible evidence" under section 3237 of the PRC, which may have prevented wells from becoming wards of the state.

SUPPLEMENTAL REVIEW FINDING IV.7

DOGGR's liability criteria meet the requirements of the Guidelines.

GUIDELINE 6.6 - STANDARDS FOR REMEDIATION

The state should ensure that abandoned wells, including the associated well site, are plugged in a cost-effective manner that removes any threat to public health and the environment and restores the land to an appropriate condition.

6.6.1. Wellbore Remediation

The state should consider existing rules and regulations when determining proper plugging procedures for abandoned sites. However, the state should have the flexibility to modify those plugging procedures, while maintaining mechanical integrity of the wellbore adequate to ensure that public health and the environment are protected.

In carrying out wellbore remediation, the state should use existing information from well records including depth of well, depth of any old plugs, presence of casing and tubing and depths set, perforations, existence of groundwater and hydrocarbon-bearing zones, existence of over-pressured zones, and any junk in the hole to determine the condition of the well and the proper plugging procedure. In the absence of the above information, data such as existing geological and engineering field studies, water well records, interviews with nearby landowners, corporate records, and historical literature can be reviewed.

6.6.2. Site Remediation

The extent of surface remediation of an abandoned site should be determined based on surface and subsurface resources and land use. Consultation by the state regulatory agency with the surface owner, surface tenant, and other federal, state and local agencies, as appropriate, should take place prior to remediation.

As appropriate, abandoned sites should be re-vegetated in accordance with state regulatory agency rules, and with consideration given to recommendations from the surface owner, surface tenant, and federal and local agencies. As appropriate, soil should be evaluated to determine if hydrocarbons, chemicals, or NORM were spilled or leaked, and to determine remediation.

Surface equipment or materials on an abandoned site should be removed, and salvaged when possible, unless the state determines otherwise. Procedures should be identified for handling NORM, if present. Due to the expense and potential damage to the land, there may be situations where equipment or materials would not be removed, e.g., a gathering system might be abandoned in place with appropriate protection. When reclaiming a pit, the state should determine the contents of the pit and how the pit can best be remediated. Once emptied, cleaned and tested as appropriate, pits should be backfilled and contoured to prevent erosion from or ponding of surface water. Monitoring wells at an abandoned site should be as necessary to protect groundwater resources. The state should develop additional remediation criteria for commercial disposal sites, as appropriate.

DISCUSSION

The state considers surface and subsurface resources and land use when determining the extent of remediation of an abandoned site.

After all down-hole plugs are in place, the surface casings and all annuli are plugged at the surface with at least a 25-foot cement plug and all well casing is cut off at least 5 feet below the surface of the ground.

Because future land-use issues fall under the purview of the local governments, local governments are the “lead agency” and the DOGGR acts as a “responsible agency” in determining the level of remediation at abandoned sites. The CEQA was enacted in 1970 in order to ensure that state and local agencies consider the environmental impact of their decisions when approving a public or private project, such as remediation of an abandoned site. The lead agency solicits and receives comments from other public agencies (“responsible agencies”) that have a role in permitting or approving a project.

The DOGGR works closely with all local agencies where oil and gas wells have been drilled and comments on land-use project proposals that include those wells. When construction is proposed over or near any previously plugged and abandoned well that does not meet current plugging and abandonment requirements, DOGGR may order the well to be re-plugged. The cost of re-plugging operations is normally the responsibility of the owner of the property upon which the structure will be located (see Section 3237 for exemptions).

SUPPLEMENTAL REVIEW FINDING IV.8

DOGGR has very defined criteria for wellbore plugging and less defined criteria for site remediation. DOGGR relies on local entities to make these determinations. There was discussion that additional work is required to determine appropriate levels of site cleanup. The lack of clarity in this regard can result in delays of site clean up.

SUPPLEMENTAL REVIEW RECOMMENDATION IV.8

The review team recommends that the state consider establishing a set of minimum criteria for site remediation. Criteria should include standards as outlined in Section 6.6.2 of the Guidelines. The Central Coast local entity has developed draft oilfield lease restoration guidelines, which might serve as a basis for statewide guidelines for site remediation.

GUIDELINE 6.7 - PUBLIC PARTICIPATION

The state abandoned sites program should provide for public participation. At a minimum, the public should have: (1) access to information about the program; (2) the opportunity to participate in any rulemakings associated with the program; and (3) a statutory or regulatory mechanism to petition the state agency to change a site's status on the inventory and/or the level of remediation required on a site.

6.7.1. Access to Information

The state should maintain and make available to the public, records related to the abandoned sites inventory, including: (1) the location of an abandoned site; (2) the extent and degree of contamination of the abandoned site; and (3) the method of remediation that has been or will be required for an abandoned site. In addition, the state should maintain public records on the state's progress with respect to implementing the abandoned sites program.

6.7.2. Participation in Rulemaking

The state program should provide an opportunity for the public to participate in any rulemakings associated with the program.

6.7.3. Participation Regarding Priority on the Inventory and Level of Remediation

The state program should include a mechanism by which an affected person could petition the state to: (1) add a site to the abandoned sites inventory; (2) change the priority for remediation of a site on the inventory; and (3) conduct or require additional remediation of a site.

DISCUSSION

The basic purpose of CEQA is to inform state agencies and the public about potential, significant environmental effects of proposed activities and to provide for public participation. In addition, regulations are adopted only after public notice and opportunity for comment is provided. Furthermore, the DOGGR notifies affected landowners prior to plugging orphaned wells. DOGGR is making all attempts to increase public outreach and operator contacts.

DOGGR maintains and makes available to the public records related to idle and orphaned wells and DOGGR's progress with respect to implementing the idle and orphaned wells program.

DOGGR provides opportunities for the public to participate in any rulemaking associated with the program. Such opportunities are notices (in various newspapers) via the State's Office of Administrative Law.

DOGGR is very open and responsive to requests to add a site to the orphaned well inventory or consider reasons to re-prioritize plugging of a particular well.

SUPPLEMENTAL REVIEW FINDING IV.9

The State program meets the requirements of the Guidelines for public participation for its orphaned well program.

GUIDELINE 6.8 - AVOID FUTURE ABANDONED SITE PROBLEMS

Since abandoned sites may constitute a threat to public health and the environment, the state should:

- a. Establish and implement an abandoned site program consistent with the guidance in this section; and*

b. Enforce its existing regulatory program, with modifications, if necessary, consistent with this guidance.

DISCUSSION

In addition to the idle and orphaned well program previously discussed, DOGGR has strengthened the law by giving the State Oil and Gas Supervisor the authority to seek a court order directing that production from a well operation be discontinued until an unresolved violation is remedied and the civil penalty has been paid (PRC section 3236.5) and to deny proposed well operations if the operator has outstanding civil penalties or other charges (PRC section 3203).

V. Naturally Occurring Radioactive Materials (Guidelines Section 7 – All New)

Follow-up to Initial Review Recommendations

INITIAL REVIEW FINDING I.23.

A thorough evaluation of the NORM survey data by the appropriate state agency is necessary before DOGGR or other state agencies should conclude NORM is not a problem in California. The review team applauds the efforts of the regulated community to voluntarily conduct extensive NORM sampling, and the need for such an independent evaluation should not be construed as a criticism of those efforts.

INITIAL REVIEW RECOMMENDATION I.23.

Although outside the scope of the IOGCC Guidelines, a thorough evaluation of the NORM survey data obtained by the regulated community should be conducted by the relevant agencies before conclusions regarding the nature of the NORM problem in California can be drawn.

CALIFORNIA RESPONSE:

DOGGR – The DOGGR and the Department of Health Services Radiologic Health Branch completed an independent NORM survey that was published in October 1996. The study confirmed most of the findings of the 1987 survey. Elevated levels of NORM were found in material from some of the production facilities; however, the elevated levels were not high enough to be of immediate health concern. Significantly, about 78 percent of the meter measurements from this study indicated radiation at background levels only.

FOLLOW-UP REVIEW FINDING I.23

Although outside the scope of the initial review, this recommendation has been met under the current Guidelines.

Supplemental Review Finding and Recommendations

GUIDELINE 7.2 - General

States should adopt an oil field NORM regulatory program that addresses identification, use, possession, transport, storage, transfer, decontamination, and disposal to protect human health and the environment. States may choose not to adopt such a program if they find, based on field monitoring data and other scientific information, that no NORM is present in oil and gas operations in the State, or that the levels of NORM present in oil and gas operations in the State do not present such a risk to human health or the environment to warrant a regulatory program. States that make such a finding should periodically reevaluate the basis for the determinations.

If a state determines that a regulatory program is necessary, it should tailor its program to NORM occurrence in the oil and gas E&P industry and an assessment of risks to human health and the environment. The program should include the elements listed in section 7.3. Oil-field NORM should be managed in accordance with the pollution prevention and waste management hierarchy provisions of these guidelines. In addition, the other sections of these guidelines apply, where applicable, to NORM as a constituent of E&P waste.

SUPPLEMENTAL REVIEW FINDING V.1

The Department of Health Services (DHS), Radiologic Health Branch is responsible for monitoring, evaluating and overseeing NORM levels and disposal of waste containing radioactive materials. DOGGR is also responsible for overseeing the disposal of NORM waste if it is designated a Class II-type fluid. DOGGR and DHS completed an independent study of NORM in

1996. The study confirmed most of the findings of a 1987 industry survey which indicated that NORM released in the production of oil and gas is not posing a threat to public health, in that highly radioactive materials with long half-lives that can accumulate in soil and water are not being released.

DHS has chosen not to develop a specific program for oilfield NORM at this time.

SUPPLEMENTAL REVIEW RECOMMENDATION V.1

DHS should continue to monitor the need for an oilfield NORM regulatory program.

GUIDELINE 7.3 – ELEMENTS OF AN OILFIELD NORM PROGRAM

7.3.1 Definition

States should develop a definition for NORM that is consistent with that which occurs in the oil and gas E&P industry. For purposes of these guidelines, NORM is defined as any naturally occurring radioactive materials (not including byproduct, source or special nuclear material, or low level radioactive waste) not subject to regulation under the Atomic Energy Act, whose radionuclide concentrations have been enhanced by human activities such that potential risk to human health or the environment are increased.

7.3.2 Action Levels

States should establish risk-based numerical action levels above which NORM is regulated taking into consideration the risk of exposure to human health and the environment. Such action levels should also be used to regulate the transfer or release of equipment, materials, and sites.

7.3.3 Surveys

States should develop standards for survey instruments and procedures for identifying and documenting equipment, materials, and sites that may contain NORM above the action levels. States should consider the types of facilities to be surveyed, when surveys should be performed, when survey results should be reported to the state regulatory agency, and any necessary training of surveyors. State survey requirements should provide data necessary to meet the purposes described in section 5.2.1 and to administer and enforce state program requirements effectively.

7.3.4 Worker Protection

State regulatory programs should include applicable state and federal standards for worker protection from exposure to radiation, including worker protection plans, and other standards necessary for the protection of workers from exposure to NORM. States should establish NORM training or certification requirements based upon oil-field work related duties and their associated NORM exposure risk (i.e., NORM awareness training may be sufficient for many common oil-field work activities).

7.3.5 Licensing/Permitting

- a. General licensing/permitting: Persons who possess oil-field NORM in concentrations or at exposure rates that exceed state-adopted action levels should be generally licensed or permitted.*
- b. Specific licensing/permitting: Specific licenses or individual permits should be required for commercial storage, removal, decontamination, remediation, treatment or disposal of oil-field NORM. A state may require specific licenses or individual permits for the management of oil-field NORM at centralized facilities as defined in section 5.10.*

7.3.6 Removal/Remediation

States should consider performance standards for removal, decontamination, and remediation that are protective of human health and the environment.

7.3.7 Storage

States should establish standards for storage of NORM that are protective of human health and the environment. NORM storage facilities should be constructed to prevent or minimize releases. Tanks used to store oil-field NORM should meet the requirements of section 5.9 of these guidelines. A state should consider adoption of limits on the amount of time NORM that exceeds action levels can be stored, depending on factors such as quantity, radioactivity, climate, proximity to the public, and protective controls.

7.3.8 Transfer for Continued Use

State regulatory programs should allow for the transfer of land and equipment containing NORM for continued operations in the production of crude oil and natural gas, with appropriate notification to affected parties.

7.3.9 Release of Sites, Materials, and Equipment

State regulatory programs should address the levels below which, and conditions under which, equipment, materials, and sites containing NORM may be released. State regulatory programs should authorize the release of equipment, materials, and sites for unrestricted use only if NORM is below action levels. Such regulations should provide for appropriate notification to affected persons.

7.3.10 Disposal

State regulatory programs should authorize disposal alternatives within the state's jurisdiction for various E&P wastes containing NORM, including contaminated equipment, and should include regulatory requirements for NORM disposal that are protective of human health and the environment. Landowner or other notification may be required as a condition of disposal. Commercial and centralized NORM disposal facilities should meet the criteria of section 5.10.

7.3.11 Interagency Coordination

State radiation programs, oil and gas programs, and waste management programs are frequently distributed among separate agencies. Therefore, in many states, multiple agencies may regulate NORM. The various agencies should coordinate their regulatory and enforcement activities under the guidance given in section 4.4 of these guidelines.

7.3.12 Public Participation

State regulatory programs for NORM should meet the public participation guidelines established in section 4.2.2.

SUPPLEMENTAL REVIEW FINDING V.2

The State generally meets the guidelines for an oilfield NORM program. The greatest threat is the exposure of workers to radon released in production and NORM accumulated in tank bottoms, sludge, pipe scale and soil. The 1996 NORM Study by DHS, in cooperation with DOGGR, provided recommendations (p.5 of the Study) that provide guidelines for future evaluation.

SUPPLEMENTAL REVIEW RECOMMENDATION V.2

In accordance with Guidelines 7.3.4, DOGGR and DHS should encourage industry to continue to monitor and minimize worker exposure. The recommendations in the 1996 study should be reviewed in future STRONGER evaluations. These recommendations recognized where NORM may pose a threat of contamination, especially to workers, and provide a basis for future review.

GUIDELINE 7.4

The Conference of Radiation Control Program Directors has prepared suggested state regulations for NORM, and a number of states have developed or are in the process of developing NORM regulations. States that are developing their own NORM programs are encouraged to consult these sources as well as applicable federal radiation guidance and requirements for information and assistance. In addition, states should encourage and keep abreast of ongoing and future research on NORM, including risk assessment.

VI. Performance Measures (Guidelines Section 8 - New Section)

The Performance Measures section was added to the Guidelines adopted in June, 2000. In its most basic sense, performance measurement is simply a management tool used to assist an organization in meeting its goals and objectives. Effective performance measurement should evaluate not only how well the work is being done within an organization, but also how well that work is contributing to meeting the organization's goals and objectives.

GUIDELINE 8.1

Beyond the general, technical and administrative criteria set forth elsewhere in this guidance document, an effective program for the regulation of E&P waste should periodically evaluate whether the program is meeting the goal of protecting human health and the environment in accordance with section 3.2.

Performance measures may be of a wide variety, may require the development of a process and methodology, and may include both input parameters and output parameters. Performance measures should include positive indicators as well as negative indicators. States should evaluate the selection and use of all types of parameters to determine what is an appropriate method to evaluate the effectiveness of their E&P waste program.

The documentation of the selected parameters and the ability to support the data utilized in the development of the measures is a critical part of any performance measure.

SUPPLEMENTAL REVIEW FINDING VI.1

While all the agencies involved in E&P waste management have performance measures, it is unclear how DOGGR, the SWRCB and the RWQCBs evaluate whether the E&P waste management program is meeting the goal of protecting human health and the environment. The component pieces of a measurement system -- planning, objectives and selected targets -- are in place; however, the process hasn't been formalized and institutionalized. In addition, it is unclear how frequently such evaluations are made.

SUPPLEMENTAL REVIEW RECOMMENDATION VI.1

DOGGR, the SWRCB and the RWQCBs should institute a more formalized process to periodically evaluate whether the E&P waste management program is meeting the goal of protecting human health and the environment. (Guidelines 3.2 and 8.1).

SUPPLEMENTAL REVIEW FINDING VI.2

The agencies have identified some parameters, both positive and negative, that indicate whether program activities are resulting in an improvement to human health and the environment. DOGGR, for example, has established program targets for remediation of orphaned wells. For the RWQCB's the closure of sumps represents the elimination of potential pollution sources. The State's system for reporting and addressing spills has potential for providing a measure of success in reducing the volumes of wastes escaping into the environment. The review team notes, however, that insufficient information exists for the tracking of some parameters: for example, none of the agencies know the extent or volume of contaminated soils; and there is currently no monitoring of the status of groundwater to demonstrate long-term improvement or change.

SUPPLEMENTAL REVIEW RECOMMENDATION VI.2

DOGGR, the SWRCB and the RWQCBs should consider additional parameters for evaluating whether program activities are resulting in an improvement to human health and the environment. For example, the RWQCBs might consider how many abandoned facilities that impact waters of the state have been remediated. DOGGR might consider how many oil spills have affected waters of the

state. As a waste minimization measure, the agencies might consider what percent of E&P wastes is being reduced or reused/recycled annually. These are offered only as examples; the review team recognizes that the individual state agencies are in the best position to determine the measures most relevant and useful to their operations. (Guidelines 3.2, 8.2.1 and 8.2.2). However, the Review Team recommends that DOGGR consider tracking of the wells that become orphaned and the causes for that change in status. (Guidelines 8.2.1.f).

GUIDELINE 8.3

The evaluation of a state program should be conducted both to determine consistency with the goals set forth in section 3.2 and to create a benchmark against which to compare itself in future assessments.

A state program is encouraged to conduct periodic self-assessments in addition to those assessments conducted in the State Review Process. These self-assessments should document successes as well as identified weaknesses. This will allow for continual improvement of a state's program, while recording its successes. Because the State Review Process is dependent on benchmarking and shared learning, documentation by states is critical in allowing states to learn from each other outside of the State Review Process.

The utilization of performance measures and a continual improvement process will demonstrate the state's efforts to adapt to changes in technology, and concerns of the public and regulated community, and to provide both for the documentation of successes of the states' programs, and identification of program areas requiring further review and improvement.

SUPPLEMENTAL REVIEW FINDING VI.3

The agencies appear to use the parameters discussed above for benchmarking future agency performance. Additional opportunities may exist to evaluate the effectiveness of the state's program in reducing violations that adversely affect human health and the environment using benchmarks such as: the numbers of orphaned wells in the state's inventory, the types and frequencies of other violations, and the numbers of violations corrected in a timely manner. See the other parameters discussed above.

VII. Underground Injection Control

Part I: GENERAL

The California underground injection control (UIC) program was initially reviewed in 1989. At that time, the California Division of Oil, Gas and Geothermal Resources (DOGGR) was known as the Division of Oil and Gas. DOGGR continues to implement a well-managed UIC Program that is protective of underground sources of drinking water (USDW). The review team was impressed by the high level of detail in all program areas. Statewide, the DOGGR is responsive to the changes in industry and because of well trained, qualified and experienced personnel, performs timely and efficient reviews of all types of UIC-related permit applications. Under a comprehensive MOU, the DOGGR coordinates permitting requirements and field activities with RWQCBs. In addition, the UIC program interfaces well with Bureau of Land Management (BLM) on UIC-related activities on BLM managed land.

The state's data management system has greatly improved since 1989. The database is now centralized. Interested parties may view a myriad of well information on the internet (DOGGR web site). For internal use, the system now tracks wells (API numbers, GPS locations, etc.), inspection reports, operator-submitted reports, etc. Approximately 90% of monthly injection data from operators is received in electronic format. Production and injection data from 1977 to present is stored electronically.

FINDING VII.1

The DOGGR strategic plan for the oil and gas and UIC programs contains objectives and performance measures that are generally applicable to both programs.

RECOMMENDATION VII.1

Specific objectives for the UIC program should be mentioned in the DOGGR portion of the Department Strategic Plan.

FINDING VII.2

To date, the DOGGR (state government) has contributed over 80 percent of the funding necessary to conduct California's UIC program. The Cooperative Agreement established with EPA in 1983 established a cost share agreement of 25 percent state funds (recipient) and 75 percent federal funds.

RECOMMENDATION VII.2

DOGGR should continue petitioning EPA, Region 9 (San Francisco) and continue participating with efforts of other UIC primacy states to petition EPA Headquarters (Washington, DC) for increased federal participation in UIC funding for California and for other state UIC programs.

FINDING VII.3

DTSC waste testing and classification rules require certain E&P wastes to be injected into Class I wells. Under the Federal UIC program, such wastes could be injected into Class II wells.

RECOMMENDATION VII.3

To gain flexibility in the disposal of E&P wastes and to reach consistency with most other states, the Department of Toxic Substances Control (DTSC) should re-evaluate its program to determine if federal RCRA-exempt waste under DTSC's jurisdiction can be managed more effectively through the Class II program.

Part II: PERMITTING/FILE REVIEW

As indicated in the 1989 peer review, the permitting process continues to be well thought out and logically conducted. Exclusive of the changes in the data management system, there have been no major regulatory or policy changes to the permitting/file review program since 1990. However, DOGGR is in the final stages of beta testing an electronic permitting system (e-Permit).

DOGGR is mandated to respond to each well permit application within 10 working days from the date of receipt. Due to a staff that is composed of well-trained and qualified personnel, DOGGR is able to meet this requirement. Each injection project is reviewed annually with the operator. During the reviews, the entire project (including all wells) is reviewed for compliance with permit conditions and project performance. Each year, approximately 80 percent of total UIC permits receive a file (compliance) review. File reviews are documented on the DOGGR database. Public notice of project applications must run for 3 days in a local newspaper of general circulation. The public review and comment period is 15 days.

Although cement behind casing is not required across a USDW (10,000 mg/l TDS), all intervals behind casing not filled with cement must be filled with mud. There must be cement behind casing through the injection interval, 500' above the injection interval and 100' across the 3,000 mg/l TDS interface. DOGGR requirements comply with EPA standards that require wells be cased and cemented to prevent movement of fluids into USDW's.

A conservative injection pressure gradient is used to determine the fracture gradient of each well permitted. If the operator wants a higher injection pressure, a step-rate test is conducted. The maximum allowable surface injection pressure (MASIP) would then be less than the fracture pressure. The Division's injection manual lists established fracture gradients for different areas in California.

Operators are required to file cash or indemnity bonds to cover drilling, redrilling, deepening, or operations permanently altering casing. Bond amounts range from \$15,000 to \$30,000 depending on drill depth of the well. Each commercial produced water disposal well must be covered with a \$50,000 life-of-the-well bond unless the operator has submitted a \$250,000 blanket bond.

FINDING VII.4

The permitting/file review portion of the California UIC program meets or exceeds EPA's federal UIC primacy requirements.

Part III: INSPECTIONS

The 1989 peer review found that the inspection program conducted under the California UIC program was designed to provide for the early detection of noncompliance actions and other UIC related problems. The current peer review confirms the effectiveness of the DOGGR UIC inspection program. To maintain consistency, an Associate Oil and Gas Engineer accompanies field inspectors in the field at least once each year to observe and critique their work. The MOI was formerly utilized as the state's UIC regulations. Among other things, it now provides excellent guidance to field inspectors in how to conduct field inspections and perform required tasks. The MOI is amended as necessary to address inconsistencies or changes in technology.

The DOGGR attempts to inspect each UIC wells annually while performing environmental lease/well inspections. Random samples are taken at some well sites for water analysis whenever

necessary to check compliance. Sampling procedures have been established and are described in the DOGGR's EPA-approved Quality Assurance Plan.

A major accomplishment since the 1989 review is implementation of an electronic database which is used to track MIT's, inspections, deficiencies, violations, etc. The DOGGR's main database file contains over 150,000 well identifications, keyed on API number. Such information is available to inspectors for conducting field investigations and for addressing emergency situations. DOGGR is conducting a beta testing program that allows engineers to electronically enter data collected in the field using handheld computers.

Emergency response is primarily controlled by the Office of Emergency Services. The Oil Spill Prevention and Response arm of the Department of Fish and Game is responsible for oil spills in or threatening marine environments. DOGGR works with these agencies on spills relating to oil and gas activities, including those related to the UIC program. Complaint response procedures are spelled out in DOGGR's MOI.

One concern expressed in the 1989 review appears to have been resolved. The prior review team found that while emergency and citizen complaint response time is reportedly very prompt (within 24 hours), there appeared to be no established internal time limit for responses to the various categories of emergencies and complaints. Today, response time is greatly diminished, but still depends upon the nature of the complaint and whether DOGGR field engineers are available. If a complaint is received during working hours, the inspection is usually done the same the day. If the complaint is received after hours, the inspector on call will determine the severity of the complaint. If severe, he/she will inspect the site immediately; if not severe, the incident will be investigated the following workday.

FINDING VII.5

Although oil and gas operators do not receive a copy of completed inspection reports from DOGGR inspectors, a letter of noncompliance is sent to the operator when violations or deficiencies are noted.

FINDING VII.6

In response to concerns in the 1989 peer review, DOGGR indicated follow-up inspections are now conducted on a more frequent basis to determine if cleanup activities for E&P waste spills are proceeding in an appropriate and timely manner. Coordination with several other federal, state and local governmental agencies is frequently required.

Part IV: MECHANICAL INTEGRITY TESTING

The DOGGR continues to have excellent guidelines for performing mechanical integrity pressure tests. DOGGR relies on a combination of RA (RTS), temperature and spinner surveys to demonstrate internal and external mechanical integrity. At least two of these three tests must be employed for a complete MIT. Tracer surveys are required on steam injection wells every 5 years, every 2 years on waterflood wells and every year on disposal wells. Cement records are never used to determine MIT. In 1996, the regulations were amended to include mechanical integrity testing of the casing-tubing annulus every five years.

FINDING VII.7

Although new regulations in 1996 amended testing requirements to include mechanical integrity testing of casing tubing annulus every five years, DOGGR continues to rely primarily on a

combination of RA (RTS) temperature and spinner surveys to demonstrate external mechanical integrity.

Part V: COMPLIANCE/ENFORCEMENT

The compliance/enforcement component of the California UIC program, as implemented by DOGGR, is adequately administered and requires compliance with state rules, regulations and directives. Field engineers are well trained and knowledgeable in DOGGR regulatory and legal requirements. Operations found to be out of compliance are brought to the attention of the operator on an informal basis. Civil penalties are considered, usually, after other attempts to obtain compliance have failed. DOGGR may deny permits for new wells if the operator fails to pay a civil penalty and other charges that are required, such as the oil and gas production assessment. The DOGGR may also seek a court order shutting in production on a well where an unresolved violation is occurring.

DOGGR may coordinate enforcement activities with EPA if unable to achieve compliance or coordination with the operator. In addition, the MOA with the SWRCB outlines the procedures for reporting proposed oil, gas and geothermal field discharges.

Bonds are forfeited when an operator fails to P&A a well or wells, but can be forfeited for other reasons, such as failure to clean up a spill or screen a sump associated with a well.

FINDING VII.8

The compliance/enforcement component of the California UIC program is adequate to determine operator compliance with applicable rules and regulations and is therefore protective of USDWs.

Part VI: ABANDONMENT/PLUGGING

DOGGR has extensive and comprehensive plugging and abandonment regulations. About 80% of all plugging jobs are witnessed. Some local governmental agencies require life-of-the-well bonds. DOGGR sends copies of formal plugging and abandonment orders to these agencies as well as a letter inquiring as to the existence of a bond. If a bond exists, it is pursued as a source of funds to cover the cost of work performed by the DOGGR.

Since 1990, legislation was passed (1998) that gave operators a set of options to cover liability for their long-term idle wells. For more information about the orphaned and idle well program, see Section 6 of this report.

In 1989, the review team was concerned that the 2-year idle-well time frame may be too long for adequate regulatory action. Although the time frame has been increased to 5 years, the bonding requirements have more than alleviated the concern shown in the 1989 review. Funding is available to plug and abandon such wells. Bonding is tracked in each DOGGR district office.

FINDING VII.9

The plugging and abandonment component of the UIC program in the State of California is protective of USDW's and provides appropriate mechanisms to administer and fund an idle well program.

Part VII: PUBLIC OUTREACH

With regard to permitting activities, the California UIC program has a good public outreach program in place. Mailing lists are used as necessary and include local, regional and national interest groups. Interest groups were most recently involved in legislation that improved funding options for idle wells. No one has ever requested a public hearing for an injection or disposal well application. EPA is provided an opportunity to review and comment on proposed UIC regulations before they are submitted for public review. In accordance with the DOGGR/SWRCB MOA, DOGGR informs SWRCB of any UIC program changes if it significantly modifies the MOA. There have been no major changes in the DOGGR public outreach program since 1990.

FINDING VII.10

There appears to be no lack of effort by DOGGR personnel to increase public awareness and knowledge of the UIC program in California. A comprehensive description of the program is posted on the DOGGR website, pamphlets are distributed which describe the program, notices are posted in newspapers, DOGGR personnel visit schools regularly to explain the oil and gas and UIC programs, and a Department of Conservation booth is manned at the annual state fair and on the Capitol grounds during Earth Day. In addition, various public outreach functions have been attended to increase public awareness.

RECOMMENDATION VII.10

DOGGR should continue to attempt to increase public awareness of the California UIC program.

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APPENDIX I

Completed California Follow-up Review Questionnaire

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**QUESTIONNAIRE FOR FOLLOW-UP AND SUPPLEMENTAL REVIEW
F STATE OIL AND GAS ENVIRONMENTAL REGULATORY
PROGRAMS**

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Completed by: **Michael Stettner**

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Telephone: **(916) 324-1806**

Questionnaire Coordinator: **Michael Stettner**

INSTRUCTIONS: The primary bases for this review are the Guidelines for State Review of Oil and Natural Gas Environmental Regulatory Programs (June 2000), and the recommendations of the initial report of the review your state's Oil and Gas regulatory program. The major objectives of the follow-up review are to evaluate your state's responses to the initial review recommendations, and to evaluate the regulatory program against changes made to the Guidelines since the initial review.

Please answer the questions as completely as reasonably possible, keeping the purposes of the follow-up review in mind. Avoid supplying extensive background information, data, regulations or statutes that do not address issues in the review recommendations or the Guidelines, or are not related to the state's oil and gas environmental programs. (For example, regulation of underground fuel storage tanks is not addressed in this review.) The purpose of this questionnaire is to elicit information that will provide a fair and balanced characterization of the state's regulatory program, rather than an exhaustive inventory of waste management facilities. Terms used in this questionnaire have meanings consistent with those contained in the Guidelines. Citations that appear in brackets (e.g., [5.3.]) following each question refer to the applicable section or sections of the Guidelines.

A computer disk containing the questionnaire in either Word 97 or Word Perfect 8.0 has been provided to facilitate your preparation of the document.

REQUESTED BACKGROUND INFORMATION

- I. Please revise and update, as appropriate, the introductory material in the report of the initial review.
- II. Please provide brief descriptions of the main developments in your state program since the last state review.

DOGGR:

- **Increased oil and gas well bonding requirements.**
- **Augmented the Public Resources Code (PRC) to explicitly give the DOGGR authority for tanks and pipelines integrally associated with oil and gas production.**
- **Improved idle/orphan well abatement by increasing financial assurance requirements, decreasing the State's potential future liability for deserted oil and gas wells, and providing incentives to allow for an operator to rework an orphaned well in an attempt to regain production.**
- **Strengthened DOGGR law to shut in production on a lease where an unresolved violation is occurring and to deny proposed well operations if the operator has outstanding civil penalties or other charges.**
- **Public hearing provisions were improved to provide more time to review and hear public appeals.**
- **Adopted more stringent regulations for pipelines located in environmentally sensitive areas.**
- **Digital processing (GIS) of all wells and maps is nearing completion.**
- **Developed an Internet website and enhanced electronic data processing.**

- III. Please provide a listing of the recommendations from the previous review, and your responses to each. The listing should include any implementation or action plans.

See Attachment 1.

- IV. Please provide the following in the format or formats most readily available to you:
 - A. References to all statutes, rules, regulations, orders, and other documentation reflecting changes made in response to recommendations contained in the report of the initial state review.

Sections 3008, 3202, 3204, 3205-3205.5, 3206, 3208.1, 3237, 3238, 3251 and 3258 of the Public Resources Code (PRC). See Attachment 2.

Sections 1723.9, 1760, 1773, 1774, 1775, and 1776 of the California Code of Regulations (CCR). See Attachment 3.

- B. Organization chart(s) showing the structure of all agencies responsible for abandoned oil and gas sites, and oilfield NORM (naturally occurring radioactive materials).

See Attachment 4.

- C. Descriptions of references to all statutes, rules, regulations and orders applicable to abandoned oil and gas sites, and NORM from oil and gas production.
Sections

Sections 1723 – 1723.8 of the CCR.

- D. Any memoranda of understanding or similar agreements between state agencies or between the state and any other governmental entities (BLM, EPA, Indian Tribes, local jurisdictions) pertaining to abandoned sites, and NORM from oil and gas production.

See Attachment 5.

- E. Any written mission statement(s), goals, objectives and policies applicable to abandoned sites, and NORM from oil and gas production.

DOGGR mission statement and applicable mandates:

- **Promote sound engineering practices through the enforcement of regulations that encourage the prudent development of hydrocarbon and geothermal resources.**
- **Prevent damage to underground oil, gas, and geothermal deposits.**
- **Prevent damage to underground and surface waters suitable for irrigation or domestic use.**
- **Prevent other surface environmental damage, including subsidence.**
- **Prevent conditions that may be hazardous to life or health.**

- V. Also, please include on a separate page any other relevant practices, program measures, guidelines or controls applicable to your state.

- VI. The next pages contain a matrix that should be used to summarize E&P waste management practices. It is recognized that further explanation may be necessary. Don't try to capture everything in precise detail - the matrix is intended only to provide a general characterization of the scale of your program. Please provide the best data readily available. If the basis for volume determinations is approximation, for example, simply state that.

E&P Waste Management Matrix

Waste Management Practices	Number of Facilities	Volume Managed Annually	Basis for Volume Determination
Drilling	2,066 (FY 2000)	100 percent	DOGGR Annual Report
Production	46,799 (FY 2000)	307.4 million bbls (FY 2000)	DOGGR Annual Report
Special Use			
Landspreading			
Roadspreading			
Tanks	12,000 plus	100 percent	DOGGR Tank Database
Commercial Facilities:	8 Class II	100 percent	DOGGR UIC Database
Multipractice			
Landfarms			
Tank Bottom Reclaimers			
UIC Surface Facilities	25,731 (FY 2000)	100 percent	DOGGR UIC Database
Oil-Field NORM			
Centralized Facilities (non-NORM)			
Oil-Field NORM			
Municipal Landfills Accepting E&P Waste			
Underground Injection Surface Facilities	25,731 (FY 2000)	100 percent	DOGGR UIC Database
Abandoned Sites	1,935 (FY 2000)	100 percent	DOGGR Annual Report
Other			

E&P Waste Management Matrix (cont.)

Waste Management Practice	Principal Agency	Primary Statute	Primary Rules, Regulations, or Orders	Applicable Guidelines
Drilling	DOGGR	PRC 3106	CCR, Title 14, Division 2, Chapter 4	MOI
Production	DOGGR	PRC 3106	CCR, Title 14, Division 2, Chapter 4	MOI
Special Use				
Landspreading				
Roadspreading				
Tanks	DOGGR	PRC 3106	CCR Sections 1773, 1774, 1776, 1778, and 1779	MOI
Commercial Facilities: Multipractice	DOGGR Class II	PRC 3106	CCR Sections 1724.6 – 1724.10	MOI
Landfarms				
Tank Bottom aimers				
UIC Surface Facilities	DOGGR	PRC 3106	CCR Sections 1724.6 – 1724.10	MOI
Centralized Facilities: (non-NORM) Oil-Field NORM				
Municipal Landfills Accepting E&P Waste				
Underground Injection Surface Facilities	DOGGR	PRC 3106	CCR Sections 1724.6 – 1724.10	MOI
Abandoned Sites	DOGGR O&G	PRC 3106	CCR Sections 1723 – 1723.8	MOI
Other				

I. GENERAL CRITERIA

1. Are **technical criteria for E&P waste management practices** contained in a formal document? If so, please provide the appropriate reference. [3.1.f]

DOGGR – Manual of Instructions (MOI)

2. What are the **goals and objectives** of the state's waste management program? Please provide reference to the appropriate document(s). [3.2]

DOGGR – The mission of the DOGGR is to regulate the oil and gas operations within the State. This program is concerned with administration of State laws for the conservation of oil and gas resources, and for the prevention of damage to life, health, property, and natural resources.

The State Oil and Gas Supervisor is mandated under Section 3106 of the Public Resources Code (PRC) to: prevent damage to oil and gas reservoirs; prevent damage to underground and surface waters suitable for irrigation or domestic use; prevent surface environmental damage, including subsidence; prevent conditions that may be hazardous to life or health; and encourage the wise development of oil and gas resources through good conservation and engineering practices.

3. Does your program provide for **flexibility** in determining the criteria applicable to E&P waste (e.g., variation in criteria dependent on region of the state or other factors; authorization of site-specific waivers for good cause shown and consistent with program goals and objectives)? If so, please provide an example or examples and reference to the appropriate document(s). [3.3]

DOGGR – The types of fluids that could be injected in a Class II well have been modified since U.S. EPA primacy was granted. The most recent modification is allowing the injection of NORM waste in a Class II disposal well.

II. ADMINISTRATIVE CRITERIA

1. Do E&P waste permits provide **notice of the permittee's obligation** to comply with other federal, state or local requirements? If so, please provide a copy of the form(s). [4.1.1]

DOGGR – Yes. The DOGGR has a Memorandum of Agreement (MOA) with the SWRCB that outlines the procedures for reporting proposed oil, gas, and geothermal field discharges and prescribing permit requirements. These procedures are intended to provide a coordinated approach, resulting in a single permit satisfying the statutory obligations of both parties to the MOA. These procedures ensure that construction or operation of oil, gas, and geothermal injection wells and surface disposal of wastewater from oil, gas, and geothermal production does not cause degradation of waters in the State of California.

2. Has the state adopted a **state contingency plan** for response to spills and releases? If so, briefly describe, including volumes that trigger a response, time in which notification and clean up is to occur, and criteria (i.e., cleanup standards) used to assure that remediation was accomplished. Please provide reference to applicable portions of the state plan. [4.2.1.1.a]

DOGGR – Yes. The current State plan was adopted in 1983 with a marine oil spill section added in 1994. An updated plan has been developed and is at the Resources Agency for signature.

The current plan requires operators to report all spills in or threatening a waterway, or land spills over one barrel (Section 160 of the contingency plan). DOGGR regulations require that these releases be reported promptly to the agencies listed in their oil spill contingency plan and the California Office of Emergency Services (CCR Section 1722(h)). Cleanup standards in the spill contingency plan require that the responsible party restore the impacted site to its pre-spill condition (Section 530).

In 1994, the Exploration and Production Regulatory Reform Task Force (Task Force) was formed through the Cal/EPA process to identify and reduce regulatory overlap and conflicts having an impact on California's exploration and production industry. The process represented a cooperative industry and government effort, the results of which were published in 1995 as a series of findings and recommendations.

An issue identified in the report concerned California's onshore (San Joaquin Valley, only) oil spill reporting requirements. The State statutory requirements to report onshore oil spills were inconsistent, vary by State code, and were inconsistent with Federal reporting quantities and standards. Further, California's existing onshore oil spill reporting requirements did not correlate with actual or potential risk to the environment or public health and safety. To address this issue, the DOGGR sponsored legislation in 1996 that developed site-specific onshore oil spill reporting requirements utilizing the DOGGR's field-rule process.

Many onshore fields operate under field rules that modify subsurface regulatory requirements to meet site-specific needs and are based on the specific physical and

operational attributes of a given oilfield. It was reasonable to apply the field-rule process to augment surface requirements, or onshore oil spill reporting, as well.

Section 3233 of the PRC was added set the minimum volumetric reporting requirement for a crude oil spill to land that is related to oil drilling and production operations at one (1) barrel. It would also establish a mechanism for establishing a less stringent requirement through the field rule process. The field rules were developed jointly by the DOGGR, SWRCB (via the Regional Water Quality Control Boards), and the Department of Fish and Game.

3. Describe any **funding** provisions to enable the state to respond to spills and releases in the event a responsible operator cannot be located or is unwilling or unable to respond, and any provisions for reimbursement of the state for moneys so expended. [4.2.1.1.b]

DOGGR – field staff routinely inspect oil spill clean-up operations as part of their fieldwork. This would include inspecting the area after the clean up of an oil or brine spill is completed. The DOGGR annual budget covers this activity. Money is set-aside in the DOGGR budget to initiate emergency control, containment, and clean-up activities when a responsible party cannot be located promptly.

4. Describe the **program planning** and **performance measurement** processes, including the following: [4.2.3, 4.3, 8.1, 8.2, 8.3]
 - a. Strategic or short-term planning.

The Department of Conservation completed its Strategic Plan in 1998. A copy will be provided upon request.

- b. Briefly describe how program goals and objectives are related to the **protection of human health and the environment**. [3.2, 8.1]

DOGGR – statutory authority mandates the DOGGR to prevent damage to life, health, property, and natural resources. The principal ongoing objectives are to routinely analyze and evaluate DOGGR programs to ensure that they continue to fulfill the statutory mandate, are timely, and are being conducted in an effective and efficient manner; and make program modifications and initiate new programs when necessary.

- c. Briefly described the program's methods for **establishing program goals and objectives**. [3.2]

DOGGR- see response to 4(b) above.

- d. How E&P waste management activities are weighted against other program activities competing for time and resources. [4.3.1, 4.3.2]

DOGGR – the priorities, in part, are outlined in response IV. E. The priority is to prevent damage to life, health, property, and natural resources and resources are distributed across the oil, gas, and UIC programs to ensure the DOGGR mandates are fulfilled.

- e. How program plan expectations are communicated to staff at all levels who are responsible for program implementation.

DOGGR is decentralized throughout the State. The Headquarters office is located in Sacramento and there are six district offices located strategic to oil and gas fields. Permitting, file review, and most compliance and enforcement functions take place at the district office level. Sacramento handles the overall administrative program functions, including policy development and general data management. Policy, program information, and administrative procedures are communicated to staff through quarterly DOGGR management conferences, the MOI, electronic weekly reports, and, as needed, via e-mail.

- f. Briefly describe how progress toward achievement of program goals and objectives is measured. [8.2]

Activity by district is compiled and reviewed on a quarterly basis and regular management conferences. See Reports and Activities.

- g. Briefly describe how information obtained from measurement of progress in achieving goals and objectives is used to alter or refine program activities. [8.3]

Concerns identified through Quarterly Reports of Activities and by district staff are discussed at periodic Division management meetings. Policy changes, regulatory change proposal, etc. may be effected as a result of these discussions.

- 5. Describe any **waste hauler training and certification** requirements for commercial transportation of E&P wastes in your state. Give reference to any statutory or regulatory provisions relating to this activity. [4.2.5]

DOGGR – N/A

III. TECHNICAL CRITERIA

A. GENERAL

1. Describe any **general performance or design standards** applicable to E&P waste management practices used in your state. Describe how these standards prevent contamination of ground water, surface water, soil or air; protect public health, safety and the environment; and prevent property damage. [5.1.a]

DOGGR – environmental protection and safety regulations apply to both production and injection activities. Regular environmental inspections help prevent leakage from tanks and other facilities. DOGGR regulations require berming of tanks to contain spills and enclosure of facilities for public safety.

2. Describe any **waste segregation** requirements or other measures applicable to E&P waste management practices and facilities that ensure that hazardous waste is not disposed with exempt E&P waste. Give the regulatory citation. Does the state require or encourage segregation of exempt from non-exempt E&P waste? [2.8.d and 5.1.b]

DOGGR – regulations governing injection activities stipulate the types of fluids that may be injected into Class II wells.

3. Are there any **air emission control** requirements applicable to E&P waste management facilities? If so, please describe and provide appropriate references. [5.1.a and 5.10.2.2.c]

DOGGR – N/A

B. PITS

1. Do you have specific technical criteria in place in your state for the following **types of pits**?
If so, please cite the reference for such criteria. [5.5.1]

<u>Type</u>	<u>Reference</u>
<u>X</u> Reserve pits	<u>Sec 3780–3787 PRC, Sec 1770 & 1778 CCR</u>
<u>X</u> Production pits	<u>Sec 3780–3787 PRC, Sec 1770 & 1778 CCR</u>
___ Skimming/settling pits	_____
<u>X</u> Produced water pits	<u>Sec 3780–3787 PRC, Sec 1770 & 1778 CCR</u>
___ Percolation pits	_____
___ Evaporation pits	<u>Sections 1760, 1770 & 1778 CCR</u>
Special purpose pits	

<u>X</u> Blowdown pits	<u>Section 1770 & 1778 CCR</u>
<u>X</u> Flare pits	<u>Section 1770 & 1778 CCR</u>
<u>X</u> Emergency pits	<u>Section 1770 & 1778 CCR</u>
<u>X</u> Basic sediment pits	_____
<u>X</u> Workover pits	<u>Section 1770 & 1778 CCR</u>
_____ Other	_____

2. What **notification** is required prior to construction and operation of rule-authorized pits? [5.5.2.d]

DOGGR – none.

3. Briefly describe any provisions concerning the issuance and use of **emergency permits** for pits. Give reference to the applicable statutory or regulatory sections. [5.5.2.e]

DOGGR – none.

4. What are the requirements for the **placement of reserve pits** relative to drilling equipment? [5.5.3.g]

DOGGR has limited jurisdiction over sumps (pits) associated with oil and gas drilling and exploration. On-site, temporary working pits associated with drilling, redrilling, reworking, or plugging and abandoning a well may be addressed in the permitting of the proposed operation. If addressed, the permit would be in accordance with the State Water Resources Control Board requirements. However, many city/county conditional-use permits do not allow the use of pits for oil and gas operations. In these jurisdictions, portable tanks are used instead.

C. LANDSPREADING (Non-Commercial)

1. Give reference for any statutory or regulatory **definitions of or prohibitions against landspreading** that are applicable in your state. [5.6.1.a]

DOGGR – N/A

2. Is on-site **landspreading of waste containing NORM** above action levels prohibited? [5.6.1.c]

DOGGR – N/A

3. Briefly discuss each of the following **operational requirements** as they apply to landspreading (give reference to any statutory or regulatory requirements): [5.6.3]

DOGGR – N/A

- a. Removal of free oil
- b. Allowable pH range of waste being disposed
- c. Spreading of solids and incorporation into the soil
- d. Application rates, methods and practices for liquids
- e. Addition of nutrients for biodegradation
- f. Waste limitations (e.g., EC, ESP, SAR)
- g. Limitations on waste-soil ratio by oil and grease content
- h. Limits on salt and hydrocarbon content in final waste-soil mixture
- i. Enhanced techniques available to meet final criteria for salt and hydrocarbons
- j. Soil analysis required prior to landspreading and/or after site closure
- k. Any additional criteria for landspreading special wastes

D. BURIAL AND LANDFILLING (Non-Commercial)

- 1. Give reference for any statutory or regulatory **definitions of or prohibitions against burial or landfilling** which are applicable in your state. [5.7.1]

DOGGR – N/A

- 2. Do you have specific **regulatory requirements** for burial or landfilling of E&P wastes? If so, give reference to the applicable statutory or regulatory sections. [5.7.2]

DOGGR – N/A

E. ROADSPREADING

- 1. Give reference for any statutory or regulatory **definitions of or prohibitions against roadspreading** which are applicable in your state. [5.8.1]

DOGGR – N/A

- 2. Briefly discuss each of the following **operational requirements** as they apply to roadspreading (give reference to any statutory or regulatory requirements): [5.8.3]

DOGGR – N/A

- a. Testing criteria that are applicable for wastes proposed for roadspreading (e.g., ignitability, density, metal content, consistency with approved road oils)
- b. Application rates
- c. Buffer zones
- d. Produced water testing (for similarity to approved commercial products)

F. TANKS

1. Give references for any statutory or **regulatory definitions** of E&P waste tanks used in your state. How are the tanks that treat, store or dispose of E&P waste regulated differently, if any, from tanks used exclusively for processing or storage of petroleum products? [5.9]

DOGGR regulations related to tanks and oilfield facilities are specific to leak detection and cleanup. In the California Code of Regulations, Title 14, Division 2, Section 1773 entitled “Tank Settings” describes requirements for the containment of spilled fluids and for the detection of leaks. There is no distinction between tanks that treat, store or dispose of E&P waste.

Tanks that are used to store unused product are regulated by the Department of Industrial Relations. The State Fire Marshal or the State Water Resources Control Board regulates tanks that are not associated with oil and gas production operations. Fluids contained in tanks are subject to regulation by various state agencies and are dependent on those agencies’ definitions of the fluid. The Department of Toxic Substances Control defines waste fluids as toxic or non-toxic.

2. Describe any requirements pertaining to the **location, use, capacity, age and construction of E&P waste tanks**, including registration, inventories, etc. [5.9.2.a]

The DOGGR tank regulations are concerned with tanks located in areas where leakage can have an adverse impact on life, health, property or natural resources. There are no provisions outlining use, capacity, age or construction properties. Oilfield production tanks have requirements for labeling and identification. The DOGGR has no tank registration or inventory requirements. However, DOGGR inspectors make regular tank environmental inspections to look for leaks and spills and maintenance problems.

3. Describe any state program pertaining to **pollution prevention requirements relating to tanks**. [5.9.2.c]

The DOGGR tank program is specific to pollution prevention. All operators having oilfield facilities located in areas where a spill and leak could affect the waters of the state are required to prepare and submit an Oil Spill Contingency Plan.

4. Briefly discuss each of the following **operational requirements** as they apply to E&P waste tanks (give reference to any statutory or regulatory requirements): [5.9.3]

- a. Corrosion protection

DOGGR - Section 1774 CCR require operators to maintain their oilfield facilities in a manner necessary to prevent leakage. Utilization of cathodic protection and corrosion inhibitors is encouraged.

- b. Structural integrity

DOGGR - See Corrosion protection above. DOGGR regulations pertain mainly to maintenance of facilities.

- c. Protection against overtopping

The DOGGR regulations related to overtopping are based on the prevention of leakage and spills. Deterrents to spills, including those caused by overtopping, are found in civil penalties imposed on violations to Division regulations.

- d. Secondary containment/leak detection

Section 1773 CCR specifically addresses secondary containment systems. Operators are required to construct secondary containment devices to contain spilled fluids and drainage systems to direct spilled fluids to a containment area. For leak detection, Section 1773 CCR specifies that tanks are required to provide for one of three possible leak detection systems: 1) that tanks be installed so that the exterior surface, including the tank bottom and connecting piping can be monitored by direct viewing; 2) tank foundations be constructed of concrete or gravel; and 3) a tank leak detection system be provided.

- e. Covers or measures to prevent entry of wildlife

Section 1773 CCR provides for the construction of fencing or barriers to prevent the entry of wildlife and people.

- f. Hydrogen sulfide emission control

DOGGR – N/A

- 5. Describe any tank **removal and closure** requirements and provide reference to statutory or regulatory requirements. [5.9.4]

DOGGR regulations, Section 1776 CCR, describe the removal and restoration of tanks. Well and lease sites are required to be returned to as near a natural state as practicable.

G. COMMERCIAL AND CENTRALIZED DISPOSAL FACILITIES

1. What agency (agencies) in your state has (have) regulatory **jurisdiction** over these facilities? [5.10.1]

DOGGR has responsibility for Class II commercial water disposal facilities.

2. Give reference for any **statutory or regulatory definitions** for commercial and for centralized disposal facilities. [5.10.1]

DOGGR – Section 3205.2 of the PRC.

3. Do you have any centralized or commercial E&P waste disposal facilities? **How many, and of what type?** Does this include any surface facilities at UIC sites? If so, how many are associated with UIC sites? [5.10.1]

DOGGR – there are 8 Class II commercial water disposal facilities within the state.

4. **What wastes are acceptable** for disposal? Do any of these facilities accept RCRA nonexempt wastes or wastes from other than oil and gas exploration and production activities? [5.10.2]

DOGGR

Aside from produced brines, the following E&P fluids are approved by the DOGGR for injection into a Class II commercial water disposal well:

- *Diatomaceous earth filter backwash.*
- **Thermally enhanced oil recovery (TEOR) cogeneration plant fluid.**
- **Water-softener regeneration brine.**
- **Air scrubber waste.**
- **Drilling mud filtrate.**
- **Tank bottoms.**
- **NORM.**
- **RCRA-exempt oil and gas waste.**

5. What are the **disposal and treatment methods** employed at these facilities? [5.10.2]

DOGGR – fluids are stored in tanks and injected.

6. What elements are required as part of the **permit** application (e.g., siting plan, construction plan, operating plan, closure plan, etc.)? [5.10.2.2.a]

Commercial disposal well requirements for siting, permitting, disposal methodology, and closure are the same as other Class II disposal wells (Sections 1724.6–1724.10 of the PRC). However, access control is more stringent than other Class II disposal wells, requiring that an authorized representative of the operator be present when deliveries are made. Records of such deliveries must clearly state the volume of fluid and the original source of the wastewater. Also, when an authorized representative is not present, the facility must be locked.

In addition, the DOGGR requires a \$50,000 indemnity bond or a \$250,000 blanket bond to operate a commercial Class II wastewater disposal well.

7. If permit applications are required for **siting**, do they include: [5.10.2.2.b]

___ Names, addresses and phone numbers of the owners or operators of the facility?

DOGGR – Yes.

___ Names, addresses and phone numbers of owners or occupants of properties in close proximity of the site, or any other persons who may reasonably be adversely affected by releases from the site?

DOGGR – No.

___ Topographic map that shows all highways, water courses, water wells, and dwellings within one mile of the site?

DOGGR – No.

___ Geologic, hydrologic, engineering, chemical and any other data or information that demonstrate disposal of wastes and operation of the facility will not contaminate fresh water, the surrounding soils or air, endanger public health, safety or the environment, or cause property damage?

DOGGR – Yes.

___ Average annual precipitation and evaporation rate at the disposal site?

DOGGR – No.

___ Nature and permeability of vadose zone; description of the extent of underlying aquifer(s), and depth to ground water; direction of groundwater movement; data on water quality of nearby surface waters and underlying aquifer(s) prior to commencement of operations; and points of past or current use of surface or groundwater?

DOGGR – No.

___ Proof that all public notice requirements have been met?

DOGGR – Yes.

___ Certification by an authorized representative of the applicant that information submitted in the application is true, accurate and complete to the best of the applicant's knowledge?

DOGGR – Yes.

___ Construction plan that includes detailed engineering drawings and diagrams of engineered disposal facilities?

DOGGR – Yes.

8. Describe any **construction** requirements that will minimize or prevent releases to surface water, ground water, soil and air. In the case of reclamation facilities, describe any such requirements that apply to waste before and after reclamation. [5.10.2.2.c]

DOGGR – the following are CCR provisions.

1744. Drilling Regulations

All exploratory wells and initial development wells on offshore sites shall be drilled or reworked in accordance with these regulations, which shall continue in effect until field rules are established. After field rules have been established, development wells shall be drilled or reworked according to such rules.

(a) Where sufficient geologic and engineering information is available from previous drilling, operators may make application to the supervisor for the establishment of field rules for each oil or gas pool or zone. The supervisor shall review field rules at least once a year and notify operators in writing of any change.

(b) Drilling or reworking of wells shall not commence without approval of the division. Notices of intention and approvals shall be considered cancelled if the proposed operations are not commenced within one year of receipt of the notice. Each proposal to drill or rework a well shall include all information required on division forms and a detailed work program including, when applicable, casing, cementing, drilling fluid, and blowout prevention programs, proposed bottom hole location, anticipated location of the intersection of each proposed zone of completion with the bore hole, anticipated pressures, and anticipated depths (both measured and vertical) of geologic formations, oil zones, gas zones, and freshwater zones. The casing, cementing, drilling fluid, and blowout prevention programs shall comply with either the following requirements or established field rules.

1744.1. Casing Program

All wells shall be cased and cemented in a manner that will fulfill the requirements of Sections 3106, 3219, 3220, and 3222 of Division 3 of the Public Resources Code. The proposal to drill, redrill, or deepen shall include a casing program designed to provide for firm anchorage and for full protection of all oil, gas, or fresh water zones. All casing strings shall be new pipe or equivalent, capable of withstanding all anticipated collapse and burst pressures to be encountered or used. For the purpose of these regulations, the several strings in order of normal installation are conductor, first surface, second surface, intermediate, protective, and production.

Casing strings shall be run and cemented prior to drilling below the specified setting depth, subject to minor variations necessary to allow the casing to be set in firm compacted or consolidated stratum. All depths refer to true vertical depth

(TVD) below the ocean floor, unless otherwise specified. Determination of proper casing setting depths shall be based upon all geological and engineering factors, including but not limited to the presence or absence of hydrocarbons, formation pressures, fracture gradients, lost circulation intervals, and the degree of compaction or consolidation of formations.

1744.2. Description of Casing Strings

Names of strings used by the division are not always the same as those used by the federal government for wells drilled on the Outer Continental Shelf. Where there is a difference, the division name is given first followed by the federal name shown in parentheses.

(a) Conductor casing (drive or structural). This casing may be set by drilling, driving, or jetting to a depth of approximately 100 feet to provide hole stability for initial drilling operations. This casing may be omitted, when approved by the Offshore Unit, if there is geological evidence that hydrocarbons will not be encountered while drilling the hole for the first surface casing and is not needed for hole stability.

(b) First surface casing (conductor). This casing shall be set at a minimum depth of 300 feet or a maximum depth of 500 feet provided that this casing string shall be set before drilling into shallow strata known to contain oil or gas or, if unknown, upon encountering such strata.

(c) Second surface casing (surface). This casing shall be set at a minimum depth of 1,000 feet or a maximum depth of 1,200 feet below the ocean floor, but may be set as deep as 1,500 feet, in the event the surface casing is set at a depth at least 450 feet.

(d) Intermediate casing. This casing shall be set if the proposed total depth of the well is more than 3,500 feet. When surface casing is set at deeper than 1,000 feet, the proposed total depth of the well may be extended two (2) feet for each foot of surface casing below 1,000 feet.

(e) Protective casing. This casing shall be set when required by well conditions, such as lost circulation or abnormal pressures. When this string does not extend to the surface, the lap shall be cemented and tested by a fluid entry test to determine whether a seal between the protective string and next larger string has been achieved. The test shall be witnessed and approved by a division inspector and recorded on the driller's log.

(f) Production casing. This casing shall be cemented as noted in Section 1744.3 below and a test of water shut-off made above the zones to be produced or injected into. The test shall be witnessed and approved by a division inspector before completing the well for production or injection. In injection wells, the supervisor may approve the demonstration of the shut-off by running of a survey within 30 days after injection commences. The survey must show that injection fluid is confined to the approved injection interval.

When the production string does not extend to the surface, the lap between the production string and next larger casing string shall be cemented and tested as in the case of protective casing. The surface casing shall never be used as production casing unless all lower oil or gas zones are properly plugged.

1744.3. Cementing Casing

The conductor (if drilled or jetted) and surface casings shall be cemented with sufficient cement to fill the annular space back to the ocean floor. The intermediate casing shall be cemented with sufficient cement to fill the annular space back to the ocean floor or at least 200 feet into the next larger string of pipe. The protective and production casings shall be cemented so that all fresh water zones, oil or gas zones, and abnormal pressure intervals are covered or isolated, and, in addition, a calculated volume sufficient to fill the annular space to at least 500 feet above cementing points, above oil or gas zones, and above abnormal pressure intervals not previously cased. When the cement behind casing is not returned to the ocean floor or through a lap, the amount of solid cement fill behind casing shall be determined by surveys acceptable to the supervisor. If the annular space is not adequately cemented by the primary operation, the operator shall displace sufficient cement to fill the required annular space. Upon demonstrating shut-off above the zones to be produced or injected into as indicated under (f) above, the operator may continue with the approved operations.

1744.4. Pressure Testing

Prior to drilling out the plug after cementing, all blank casing strings, except the conductor casing, shall be pressure tested as shown in the table below. Loss in pressure shall not exceed 10 percent during a 30-minute test; corrective measures must be taken until a satisfactory test is obtained.

After cementing any of the above strings, drilling shall not be commenced until a time lapse of: eight hours for the first surface casing string and 12 hours for all other casing strings, or sufficient time for the bottom 500 feet of annular cement fill to attain a compressive strength of at least 500 psi based on a pretest of the slurry at the temperature and pressure at the cementing depth, using testing procedures as set forth by the American Petroleum Institute in RP 10B, 1972, incorporated here by reference.

All casing pressure tests shall be witnessed and approved by a division inspector prior to drilling out of the casing or perforating opposite possible oil or gas zones. Inspection of data recorded by a device approved by the division may be substituted for witnessing.

9. If permit applications are required for **operating**, do they include: [5.10.2.2.d]

___ An operating plan?

DOGGR – Yes.

___ Volume, rate and type of material to be disposed?

DOGGR – Yes.

___ Identification of the specific facilities that will be used to dispose of each waste stream (e.g., unlined or lined pits, tanks, etc.)?

DOGGR – Yes.

___ Contingency plan for reporting, responding to and cleaning up spills, leaks and releases of wastes or waste byproducts, including provisions for notifying emergency response authorities and for taking operator-initiated emergency response actions?

DOGGR – Yes (Section 1722(b) of the CCR).

___ Ground water monitoring where wastes are managed on the land?

DOGGR – N/A.

___ Plan for routine inspection, maintenance, and monitoring to ensure and demonstrate compliance with permit requirements, and in the case of landfarming, ensure that organic wastes are effectively treated?

DOGGR – Yes.

___ Specific engineering plans for preventing or minimizing the generation or emission of hydrogen sulfide gas?

DOGGR – No.

___ A plan for the onsite sampling and/or testing to assure that RCRA Subtitle C or other wastes prohibited by the regulatory agency for disposal are not disposed at such a facility?

DOGGR – Yes.

___ Characterization of wastes accepted at the facility?

DOGGR – Yes.

___ Plan for periodic removal and subsequent handling of free oil?

DOGGR – No.

___ Security plan for the facility?

DOGGR – Yes.

10. Describe the **closure and post-closure monitoring** and maintenance requirements applicable to commercial facilities, including duration of post-closure care and financial assurance release schedules. [5.10.2.2.e]

DOGGR the following are CCR provisions:

1723. Plugging and Abandonment--General Requirements

(a) **Cement Plugs.** In general, cement plugs will be placed across specified intervals to protect oil and gas zones, to prevent degradation of usable waters, to protect surface conditions, and for public health and safety purposes. At the discretion of the district deputy, cement may be mixed with or replaced by other substances with adequate physical properties.

(b) **Hole Fluid.** Mud fluid having the proper weight and consistency to prevent movement of other fluids into the well bore shall be placed across all intervals not plugged with cement, and shall be surface poured into all open annuli.

(c) **Plugging by Bailer.** Placing of a cement plug by bailer shall not be permitted at a depth greater than 3,000 feet. Water is the only permissible hole fluid in which a cement plug shall be placed by bailer.

(d) **Surface Pours.** A surface cement-pour shall be permitted in an empty hole with a diameter of not less than 5 inches. Depth limitations shall be determined on an individual well basis by the district deputy.

(e) **Blowout Prevention Equipment.** Blowout prevention equipment may be required during plugging and abandonment operations. Any blowout prevention equipment and inspection requirements determined necessary by the district deputy shall appear on the approval to abandon issued by the division.

(f) **Junk in Hole.** Diligent effort shall be made to recover junk when such junk may prevent proper abandonment either in open hole or inside casing. In the event that junk cannot be removed from the hole and fresh-saltwater contacts or oil or gas zones penetrated below cannot therefore be properly abandoned, cement shall be downsqueezed through or past the junk and a 100-foot cement plug shall be placed on top of the junk. If it is not possible to downsqueeze through the junk, a 100-foot cement plug shall be placed on top of the junk.

1723.1. Plugging of Oil or Gas Zones

(a) **Plugging in an Open Hole.** A cement plug shall be placed to extend from the total depth of the well or from at least 100 feet below the bottom of each oil or gas zone, to at least 100 feet above the top of each oil or gas zone.

(b) **Plugging in a Cased Hole.** All perforations shall be plugged with cement, and the plug shall extend at least 100 feet above the top of a landed liner, the uppermost perforations, the casing cementing point, the water shut-off holes, or the oil or gas zone, whichever is highest.

(c) **Special Requirements.** Special requirements may be made for particular types of hydrocarbon zones, such as:

- (1) Fractured shale or schist;
- (2) Massive sand intervals, particularly those with good vertical permeability; or
- (3) Any depleted productive interval more than 100 feet thick.

As a minimum for an open-hole abandonment, the special requirement shall consist of a cement plug extending from at least 100 feet below the top of the oil or gas zone to at least 100 feet above the top of the zone.

As a minimum for a cased-hole abandonment, the special requirement shall consist of a cement plug extending from at least 100 feet below the top of the zone to at least 100 feet above the top of the perforations, the top of the landed liner, the casing cementing point, the water shutoff holes, or the zone, whichever is highest.

(d) **Bridge Plug.** A bridge plug above the lowermost zone in a multiple-zone completion may be allowed in lieu of cement through that zone if the zone is isolated from the upper zones by cement behind the casing.

1723.2. Plugging for Freshwater Protection

(a) Plugging in Open Hole.

(1) A minimum 200-foot cement plug shall be placed across all fresh-saltwater interfaces.

(2) An interface plug may be placed wholly within a thick shale if such shale separates the freshwater sands from the brackish or saltwater sands.

(b) Plugging in a Cased Hole.

(1) If there is cement behind the casing across the fresh-saltwater interface, a 100-foot cement plug shall be placed inside the casing across the interface.

(2) If the top of the cement behind the casing is below the top of the highest saltwater sands, squeeze-cementing shall be required through perforations to protect the freshwater deposits. In addition, a 100-foot cement plug shall be placed inside the casing across the fresh-saltwater interface.

(3) Notwithstanding other provisions of this section, the district deputy may require or allow a cavity shot immediately below the base of the freshwater sands. In such cases, the hole shall be cleaned out to the estimated bottom of the cavity and a 100-foot cement plug shall be placed in the casing from the cleanout point.

(c) **Special Plugging Requirements.** Where geologic or groundwater conditions dictate, special plugging procedures shall be required to prevent contamination of usable waters by downward percolation of poor quality surface waters, to separate water zones of varying quality, and to isolate dry sands that are in hydraulic continuity with groundwater aquifers.

1723.3. Plugging at a Casing Shoe

If the hole is open below a shoe, a cement plug shall extend from at least 50 feet below to at least 50 feet above the shoe. If the hole cannot be cleaned out to 50 feet below the shoe, a 100-foot cement plug shall be placed as deep as possible.

1723.4. Plugging at the Casing Stub

When casing is recovered from inside another casing string (or strings), and the outer string (or strings) is cemented opposite the casing stub, a 100-foot cement plug shall be required on the casing stub. A plug on the casing stub will generally not be required when casing is recovered in open hole or from inside another casing string that is not cemented opposite the casing stub.

1723.5. Surface Plugging

The hole and all annuli shall be plugged at the surface with at least a 25-foot cement plug. The district deputy may require that inner strings of uncemented casing be removed to at least the base of the surface plug prior to placement of the plug.

All well casing shall be cut off at least 5 feet below the surface of the ground. In urban areas, as defined in Section 1760(e), a steel plate at least as thick as the outer well casing shall be welded around the circumference of the outer casing at the top of the casing, after division approval of the surface plug.

1723.6. Recovery of Casing

(a) Approval to recover all casing possible will be given in the abandonment of wells where subsurface plugging can be done to the satisfaction of the district deputy.

(b) The hole shall be full of fluid prior to the detonation of any explosives in the hole. Such explosives shall be utilized only by a licensed handler with the required permits.

1723.7 Inspection of Plugging and Abandonment Operations

Plugging and abandonment operations that require witnessing by the division shall be witnessed and approved by a division employee. When discretion is indicated by these regulations, the district deputy shall determine which operations are to be witnessed.

(a) Blowout prevention equipment--may inspect and witness testing of equipment and installation.

(b) Oil and gas zone plug--may witness placing and shall witness location and hardness.

(c) Mudding of hole--may witness mudding operations and determine that specified physical characteristics of mud fluid are met.

(d) Freshwater protection:

(1) Plug in open hole--may witness placing and shall witness location and hardness. Plug in cased hole--shall witness placing or location and hardness.

(2) Cementing through perforations--shall witness cementing operation.

(3) Cavity shot--may witness shooting and shall witness placing or location and hardness of required plug.

(e) Casing shoe plug--shall witness placing or location and hardness.

(f) Casing stub plug--shall witness placing or location and hardness.

(g) Surface plug--may witness emplacement and shall witness or verify location.

(h) Environmental inspection (after completion of plugging operations)--shall determine that division environmental regulations (California Administrative Code, Title 14, Subchapter 2) have been adhered to.

1723.7.1 Special Requirements

The supervisor, in special cases, may set forth other plugging and abandonment requirements or may establish field rules for the plugging and abandonment of wells. Such cases include, but are not limited to:

(a) The plugging of a high-pressure saltwater zone.

(b) Perforating and squeeze-cementing previously uncemented casing within and above a hydrocarbon zone.

11. For wastes not moved by pipeline, is there a requirement for **waste tracking**? If so, does it require: [5.10.2.3]

DOGGR – Yes.

___ A multi-part form that contains the names, addresses and phone numbers of the waste generator (producer), hauler, and disposal facility operator?

DOGGR – Yes.

___ Description and volume of the waste?

DOGGR – Yes.

___ Time and date it was collected, hauled and deposited at the disposal facility?

DOGGR – No.

___ Time requirement for maintenance of the form?

DOGGR – No.

___ Attesting that no illegal dumping occurred?

DOGGR – No.

___ Certification by the hauler and disposal facility operator that no wastes were dumped illegally or at a location or facility not designated by the generator or permitted to receive the waste, and that no prohibited or hazardous wastes were mixed with the waste during transport?

DOGGR – No.

___ Reporting of any discrepancies in waste descriptions, volumes or place of origin based on personal observations or information contained in the three-part form?

DOGGR – No.

12. Are **waste haulers** permitted or licensed based on a showing of basic knowledge of regulatory requirements? [5.10.2.3]

DOGGR – No.

IV. ABANDONED SITES

1. Does your state have a program to **inventory, prioritize and remediate** (as necessary) abandoned oil and gas sites? [6.1]

DOGGR – Yes.

2. Please provide reference to any **definitions** pertaining to abandoned sites or your abandoned well site program, including the types of facilities included in the definitions. [6.2]

Sections 3237, 3250, 3251, and 3251.5 of the PRC. Removal and disposal of tanks, pipelines, and other attendant facilities may be included in the abandoned well program, also.

3. Briefly describe your program for **identification, inventory and ranking** of abandoned sites. [6.3]

Wells that require formal action fall into two general categories: (a) damaging (section 3224, PRC) or deserted wells (Section 3237, PRC); and (b) hazardous or idle-deserted wells (sections 3250-3259, PRC). These wells may be either unbonded or bonded in varying amounts. The procedures for handling these two categories of wells differ slightly and are discussed in the following sections.

The DOGGR requires operators to file monthly electronic or hardcopy reports on well production and/or injection that are entered into the data management system (WellStat). Information available includes a list of all active injection wells, idle wells, volume injected, pressure, days injecting, shut in, and the source of fluid (production records tell amount of fluid and disposition). The information is posted monthly on the DOGGR's web page and printed in the Annual Report.

Deleted wells (defunct operators) are ranked. Wells that are deemed hazardous have the highest priority for being plugged and abandoned. These are followed by wells that are still bonded. The next priority is deserted wells the district deems necessary to plug, pending available funding. In 2001, the DOGGR spent \$850,000 to plug and abandon defunct oil and gas wells.

4. Briefly describe **funding** mechanisms available to the state for abandoned site remediation. [6.4]

In the 1990's, well bonding requirements had become insufficient to provide for the DOGGR to plug and abandon orphan wells.

In 1998, legislation was passed that allowed the DOGGR to increase bonding amounts for active wells by \$5,000. Individual well bonds increased to \$15,000 for wells less than 5,000 feet in depth; \$20,000 for wells between 5,000 and 10,000 feet; and \$30,000 for wells in excess of 10,000 feet. The intent with this 1998 change is that plugging and abandoning costs for a well has increased. The previous rates were established in statute in 1976.

In addition, several options were provided for operators to cover the liability of its long-term idle wells. First, an operator could take out a \$1 million blanket bond to cover all their operations, including idle wells. Second, operators could choose to pay the annual idle well fee, but on an increased scale reflecting relative hazards: for wells idle less than 10 years the fee is \$100; for wells idle 10-15 years the fee is \$250; and for wells idle for over 15 years, the fee is \$500. Third, operators may take out a \$5,000 bond for each individual idle well; fourth, operators may establish an escrow account for each idle well that must be worth \$5,000 after 10 years (any interest earned in the escrow account will be returned to the operator); and fifth, operators may establish an idle well management plan that requires operators to eliminate a certain percentage of long-term idle wells (10 years or longer) on an annual basis. For purposes of the plan, eliminate means to return to production, plug and abandon (clean-up), or turn that well into an injection or observation well. An operator choosing the Plan would not be subject to any additional idle well fees or bonding requirements. If the operator failed to meet its annual goals for plan implementation, the operator would immediately be required to secure idle well bonds or establish an escrow account for the wells.

The 1998 legislation also increased the annual funding amount the DOGGR can spend for the plugging and abandonment of orphaned wells to \$1 million for 5 years. Previously, where no operator can be located and the DOGGR had determined a well to be orphaned, statute identifies a \$500,000 fund for the DOGGR to access in contracting for the clean up. In 1994, the Legislature approved an increase from \$350,000 to \$500,000.

5. Briefly describe the criteria used in your **abandoned site prioritizing** system. [6.5]

See response to IV. ABANDONED SITES, question 3.

6. What are the state's abandoned site remediation **goals**? How is progress measured? [6.5.1]

The 1998 legislation that increased the orphaned well fund to \$1 million will sunset in two years and the fund will revert to \$500,000. At that time, a Report to the Legislature must be prepared to describe the progress made in plugging orphan wells and recommend any funding needs. In 1998, there were about 650-orphaned wells. Last year, the DOGGR plugged and abandoned 58 wells. However, the number of orphaned wells can increase at a faster rate than the DOGGR can plug and abandon them.

7. Briefly describe the state's program relating to establishing **liability** for the remediation of abandoned sites. Provide references to any statutory or regulatory allocation of responsibility. [6.5.2]

DOGGR – if an operator of a well no longer does business in the state, the DOGGR may assume responsibility to plug and abandon the well (Section 3237 and 3250 of the PRC).

8. Please provide reference to any **standards for abandoned site remediation**. [6.6]

See response to III. TECHNICAL CRITERIA, question 29.

9. Briefly describe the state's **abandoned well remediation** program, including any flexibility allowed in plugging procedures. [6.6.1]

The object of the DOGGR's idle-well program is to elevate an operator's awareness of its idle-well inventory and plug or return to production any idle wells that have no apparent future use. If the operator does not have specific plans for the well or wells, does not respond to DOGGR inquiries, has wells located in unstable terrain, or has junked holes, the wells are ordered plugged and abandoned.

Despite the DOGGR's idle well program and higher bonding levels to increase operator responsibility, a number of orphan wells still remain.

10. Briefly describe the state's program for **surface remediation** of abandoned sites, including any requirements regarding present or future land use and consultation with surface owners. [6.6.2]

After all down-hole plugs are in place, the surface casings and all annuli are plugged at the surface with at least a 25-foot cement plug and all well casing is cut off at least 5 feet below the surface of the ground.

Because future land-use issues fall under the purview of the local governments, local governments are the "lead agency" and the DOGGR acts as a "responsible agency". The California Environmental Quality Act (CEQA) was enacted in 1970 in order to ensure that state and local agencies consider the environmental impact of their decisions when approving a public or private project. The lead agency solicits and receives comments from other public agencies ("responsible agencies") that have a role in permitting or approving a project.

The DOGGR works closely with all local agencies where oil and gas wells have been drilled and comments on land-use project proposals that include those wells. The DOGGR may order the reabandonment of any previously plugged and abandoned well when construction of any structure over or in the proximity of the well could result in a hazard. The cost of reabandonment operations is the responsibility of the owner of the property upon which the structure will be located.

11. What is the program for **maintenance of records** of remediated sites? How is public access assured? [6.6.3]

The DOGGR maintains a hardcopy file for every oil and gas well drilled in the state. In addition, copies of the well files are maintained on microfiche and microfilm. The public has full access to all nonconfidential well records.

12. Describe any **public participation** activities associated with the abandoned sites program, including public access to information, public participation in rulemaking associated with the program, and participation regarding the priority of sites on the inventory and level of remediation. [6.7]

The basic purpose of CEQA is to inform state agencies and the public about potential, significant environmental effects of proposed activities and to provide public

participation. In addition, regulations are adopted only after public notice and opportunity for comment is provided. Furthermore, the DOGGR notices affected landowners prior to plugging orphan wells.

V. NATURALLY OCCURRING RADIOACTIVE MATERIAL

1. Discuss any activities the state has undertaken to determine the **occurrence and need for regulation** of NORM. [7.2]

In 1987, the DOGGR requested the Western States Petroleum Association (WSPA) to investigate and determine the extent of elevated levels of NORM, if any. The survey consisted predominantly of external gamma radiation meter readings. In response, WSPA obtained approximately 10,000 readings from oil and gas production facilities. The results indicate that more than 93 percent of the readings were at background levels. The remaining readings were above background levels, but low enough that only routine safety measures were considered necessary to minimize employee exposure and protect human health and the environment.

In response to the 1993 IOGCC peer review of California's oil and gas exploration and production waste-management regulatory programs, the DOGGR and the Department of Health Services (DHS), Radiologic Health Branch, conducted a more comprehensive survey of selected sites. This effort was in cooperation with the oil and gas industry. The sites chosen for the study were selected because they were points where NORM was most likely to occur; the sites were not selected randomly.

Four hundred seventy-five radiation measurements were taken in 70 oil and gas fields. In addition to gamma radiation meter readings, 124 samples of pipe scale, produced water, tank bottoms, and soil were collected and analyzed by the DHS's Sanitation and Radiation Laboratory to assess the actual concentrations and radionuclides present.

The results of this study indicate that NORM is not a serious problem in California oil- and gas-producing operations, thereby, confirming findings in the 1987 study. Seventy-eight percent of the measurements in this study were at background levels. A few sites had elevated levels of NORM; however, routine protective measures may be all that is necessary to minimize exposure in these particular areas.

See Attachment 6 for a copy of the report. In addition, a copy of the report is posted on the DOGGR's web page.

2. Briefly discuss each of the following **program elements** as they apply to the NORM regulatory program (give reference to any statutory or regulatory requirements): [7.3]

The DOGGR does not have a regulatory NORM program.

- a. Definitions
- b. Action levels
- c. Surveys
- d. Worker protection

- e. Licensing/permitting
- f. Removal/remediation
- g. Storage
- h. Transfer of land and equipment for continued use
- i. Release of sites, materials, and equipment
- j. Disposal
- k. Interagency coordination
- l. Public participation

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APPENDIX II

Strengths, Other Considerations and Conclusions from the 1989 UIC review

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PEER REVIEW OF THE CALIFORNIA CLASS II UIC PROGRAM
CALIFORNIA DIVISION OF OIL AND GAS

REVIEW TEAM REPORT

REVIEW TEAM COMPOSITION

William R. Bryson	Interagency Coordinator Kansas Corporation Commission UIC Technical Programs Manager
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GENERAL PROGRAM COMMENTS AND OBSERVATIONS---BACKGROUND

1. Overall responsibility for the California Class II UIC program is contained within the Department of Conservation, Division of Oil and Gas (Division).
2. California defines fresh water as water with concentrations of 3000 mg/l or less total dissolved solids (TDS). This is a definition based on historic water usage. It was carried forward from the Division's preexisting program into its primacy program. The methods and techniques for protecting fresh waters and USDWs in casing, cementing, and plugging may vary and are discussed in the relevant sections of this report.
3. The Division's UIC program is much more decentralized than most state programs. Permitting, file review, and most compliance functions take place at the district office level. Sacramento handles the overall administrative program functions including grant application, grant monitoring, record keeping, general data management, reporting, and program oversight.
4. Program coordination between the districts and Sacramento is excellent and consists of technical assistance visits to the districts, including periodic visits by the State Oil and Gas Supervisor. Regular UIC policy and planning meetings further the program coordination between the districts and Sacramento. These two day meetings are held three times each year in each of the various district offices on a rotating basis. At these meetings the responsible program personnel from the districts and headquarters discuss the program and any new developments, requirements, or problems. The meetings help assure that the program is being conducted in the most uniform manner possible given the differing nature of the fields and geology in the State and the often changing reporting requirements of the EPA.
5. The Division has an extensive Manual of Instruction which is used throughout the agency. This manual sets out standard operating procedures and requirements for essentially all Division functions

including those related to operation of the Class II program. This manual further serves to assure that the agency's approved program is fully carried out throughout the various districts in the State.

6. Under provisions of the Safe Drinking Water Act and EPA regulations the Division prepared a concise and clear Primacy Application and was delegated responsibility for the program from the EPA. A comparison of the Primacy Agreement and the actual State program reveals that the State is indeed doing all of the things contained in that agreement.

7. The California UIC program regulates over 12,000 Class II injection wells.

PERMITTING/FILE REVIEW

A. OBJECTIVE: UNDERSTAND THE PERMIT FLOW PROCESS

All permitting and file reviews are done in the district offices by a UIC Associate Engineer. Each district may have slightly different procedures for reviewing, tracking and checking applications for completeness. A printed manual of instructions on technical criteria is used extensively for in-house reference. There are three meetings per year of UIC coordinators from the districts to help, in part, to assure uniformity of the program in the individual districts. In the larger districts, applications are reviewed by additional engineers and geologists. In these larger offices there is a greater division of responsibility and a wider field of expertise available. However, the district's UIC Associate Engineer is ultimately responsible for assuring a review is complete. Staff meetings are held to discuss proposed injection projects. Injection project approval (permit approval) and individual injection well permits (authorization to drill, etc.) are separate processes. After the project plan is approved, the operator submits notices (applications) for each well that will be drilled, converted, reworked or abandoned in the project. This procedure existed before primacy.

The California Environmental Quality Act (CEQA) is a routine element in the project review process. The Division can approve a project plan, but not the drilling, reworking, or abandonment of wells until CEQA requirements are met. The CEQA lead agency is usually the county. This agency may prepare an environmental impact statement including recommendations to mitigate impacts the project may have on the environment. As an alternative, they may prepare a declaration that the project will not cause an adverse impact on the environment. "Public" concerns are often addressed through these means. There are ordinances in four counties regulating commercial disposal wells. The CEQA statements might be expected to cause a delay in the issuance of commercial permits, however, CEQA concerns seldom impact routine disposal or enhanced recovery applications. Operators have not complained about the routine application/permit turnaround time which averages about 45 days.

Bonding requirements are also handled in the district offices. A well must be bonded prior to drilling, redrilling, or altering the well casing but the bond may be released at an operator's request after six months. This release takes place only after the Division determines that all permit requirements have been met and that the well has been injecting satisfactorily for six months. Commercial disposal wells require a \$50,000 lifetime bond. Commercial disposal wells have been defined and are subject to special permit requirements, including sampling and analysis. More stringent fluid analyses and reporting requirements for commercial disposal wells have been implemented in response to public concern that hazardous wastes might be taken to such wells in violation of permit conditions.

B. OBJECTIVE: UNDERSTAND THE FILE REVIEW PROCESS

The Division of Oil & Gas has completed 100 percent of the reviews of existing wells. Existing wells are re-reviewed with each MIT

performed and each time a well is reworked. In addition, project review meetings are held annually with the operator to evaluate project performance. All wells within the project boundary are reviewed and permit requirements are upgraded, if necessary; however, preprimacy requirements were generally as strict as current requirements. Project reviews are performed by the District UIC Associate Engineer. There is latitude and technical judgement involved in the project review process. Project approval can be rescinded if the project is not productive or represents a threat to fresh water and/or remedial work or plugging can be ordered with a deadline for compliance.

C. OBJECTIVE: UNDERSTAND THE TECHNICAL REVIEW AND RELATED ASPECTS OF THE PERMIT/FILE REVIEW PROCESS

In California, fresh water is defined as water with 3000 mg/l or less total dissolved solids (TDS). The California Department of Water Resources has mapped the occurrence of fresh water in oil and gas producing areas. For each reservoir the location and depth of fresh water has historically been determined using resistivity - SP Logs, drilling records and published data. The base of fresh water is included in published "field reports". Because the base of fresh water has often been determined in earlier years, the interpretative methods to establish the base of fresh water used at that time are not now always readily known.

It should be noted that the water in some oil and gas reservoirs would be of a quality which would be classified as usable or as a USDW. Such waters have been exempted as described elsewhere in this report. Otherwise, all hydrocarbon producing reservoirs lie below the base of fresh water. Confining formations have been determined from an accumulation of geologic and reservoir data much of which is available from published reports. There have been no fluid migration problems resulting from a lack of geologic confinement.

General casing and cementing requirements are set by the California Public Resources Code (Statute). Specific requirements are set forth in the California Code of Regulations. The regulations are the same for all types of wells. Surface casing requirements are established without regard to the base of fresh water, though the Division may vary the requirements where the base of fresh water is close to the "normal" surface casing setting depth. Normal requirements for surface casing are 10 per cent of total depth (with minimum 200 feet and maximum 1500 feet limits) cemented to surface. Exceptions are required to set deeper casing when needed. Fresh water, where not protected by surface casing, is protected by either intermediate casing or production casing. For a new completion, protection can be effected by stage cementing to place cement 100 feet above and below the base of fresh water. Squeeze cement jobs can be required for converted wells. Field rules for casing and cementing have been established.

It is not uncommon for fresh water to be protected by the same string of casing that is the production/injection string. The geologic and

hydrogeologic conditions in the State are such that it is often impractical to require that all protected waters be behind a separate string or strings of casing. Because of statutory or technical limits on the depth of surface casing, fresh water or USDWs may be found below the setting depth of such casing. While production or intermediate casing is set through such water, the base of fresh water and the injection interval are always covered by 100 feet and 500 feet of cement, respectively. In such cases the resulting relationships between the various casing depths, cement tops, and intervals of fresh water or USDWs may result in a portion of such water intervals being protected by only mud behind casing. Review Team concerns with this situation were alleviated by the historical effectiveness of these regulations in practice, the apparent absence of overpressured or artesian zones and corrosive waters, and the frequent mechanical integrity testing required on all injection wells.

Water that contains 3000 to 10,000 mg/l TDS is protected by mud behind casing in cases where the standard casing and cementing requirements do not otherwise coincidentally protect USDWs. Cement is circulated to surface for surface casing. All other casings must be cemented at least 500 feet above oil and gas zones and anomalous pressure intervals and to a minimum of 100 feet above the base of any fresh water zone protected by such casing.

Permits almost always specify the use of tubing and packer. Wells located where there is no fresh water, may not have tubing and packer. Tubing must be of appropriate grade, weight, etc. for the intended use. Inflatable packers are acceptable. In dual completions, injection down casing by gravity is allowed but is uncommon.

Operational requirements include valves on the tubing and tubing-casing annulus. Flow measurement can be made by any reasonable method. Compatibility of injection fluids with cement and/or formation fluid has not been a problem. The maximum allowable injection pressure is limited to 5 percent below the fracture pressure. Step rate tests are required unless documented data is available or pressures below the standard limit are requested by the operator.

The Division utilizes the standard 1/4 mile area of review (AOR) for examination of permit applications. The applicant submits diagrams of the current construction/condition of those wells within the AOR which penetrate the injection horizon. District personnel review this data for accuracy and make comparisons with Division maps to assure all applicable wells within the AOR have been identified.

Though rarely used, an operator could use another AOR based upon calculation of the zone of endangering influence. Corrective actions related to area of review are addressed through the project review process and may result in permit conditions. The process for tracking of corrective actions to completion varies somewhat from district to district.

Tracking is generally accomplished utilizing a manual "tickler" file.

D. OBJECTIVE: UNDERSTAND THE NONTECHNICAL PORTIONS OF THE PERMIT

Bonding levels are based on the depth of the well. Except for the special bonding of commercial disposal wells, bond amounts were last revised in 1981. The State can place a lien on real property and personal property to recover any compliance costs incurred. An operator can file a blanket bond of \$100,000 to cover an unlimited number of wells. A request for legislation to require bonding for transferred injection wells is under consideration.

Offset operators within one-quarter mile are notified of a proposed project by letter. Public notice is by means of publication of notice of project application in a local newspaper for three days. Notices for commercial disposal wells are the same as those for other projects. A 15-day comment period is provided and a 15-day extension may be given upon request. Public concerns and complaints are generally resolved prior to permitting and only three public hearings have been held since the program was implemented.

Technical permit conditions are modified when evidence from the public notice procedure shows they are warranted.

E. OBJECTIVE: UNDERSTAND THE PROCESS FOR AQUIFER EXEMPTIONS

All aquifer exemptions in the State have been and are made in accordance with the strict parameters set out in EPA regulations. Basically, this means that in order for an aquifer or a portion of an aquifer to be exempt from protection under the program, it must not currently serve as a source of drinking water in the area of injection and cannot serve as such a source because it is mineral, hydrocarbon, or geothermal energy producing. In addition, it is situated at a depth or location which makes recovery of water for drinking water purposes economically or technologically impractical, or it is so contaminated that it would be economically or technologically impractical to render the water contained therein fit for human consumption.

Numerous oil and gas producing zones in the State contain waters with TDS levels less than 10,000 mg/l and required exemption. Aquifer exemptions for these producing reservoirs were listed and included in the primacy application and were approved by the EPA. Any subsequent applications are subject to a proper filing of detailed maps and aquifer data. If the data supports the proposal for exemption, a public hearing can be held. If the exemption is to be approved, the proposal is submitted to EPA for its concurrence. Two aquifer exemptions have been approved and submitted to EPA.

In the first case an aquifer which was missed in the primacy application received EPA approval and was added to the exempt list. In the second, which received a review by the Regional Water Quality Board, it was proposed to inject 1,100 TDS water into an aquifer containing 8,800 TDS water. This application is pending before the EPA Regional Office.

PERMITTING/FILE REVIEW--STRENGTHS

1. The permitting process is well thought out and logically conducted. Check lists provide the applicant and the Division reviewer with an outline of required data on the well and the area of review. The Manual of Instruction provides an outline for review of injection well applications. This comprehensive manual addresses standard operating procedures on essentially all areas of the Division's activity. In this program it serves to assure that all program requirements are addressed and that all Divisions districts are following the same review process. The Division has broad authority to require additional data on any particular application.
2. Responsibility for permit review and approval lies with the appropriate Division district UIC Associate Engineer. Technically, persons in these positions are in job classifications which would qualify them to conduct the review. The UIC Engineer has plenty of help available to him/her both up and down the lines of authority and in the fields of engineering and geology to assist them when needed and to participate in the general review process. There are reports available for each field in the state providing information on the field including the base of fresh water.

Rob Hauser, the District Operations and UIC Engineer from the Woodland district office was present at the review and demonstrated through his participation that he had a good grasp of what his role and responsibilities in the program are and that his processes and procedures for tracking his work in permitting, corrective action, monitoring workovers, etc. are effective.

3. The State has produced a manual entitled "Evaluation and Surveillance of Water Injection Projects" which is available to the industry and the Division staff. This manual contains extensive technical justification and procedural information on many of the requirements of the California program (fracturing, step rate testing, profile testing, etc.). The manual should be a valuable tool to any person operating in the State.
4. The requirement for a step rate test and a 5% safety factor on injection pressure should provide good protection against fracturing of the injection interval and/or the confining zone.
5. The proposal to require a bond from the new operator of any transferred injection well is a good one. There is a reasonable concern that as "solvent" larger operators dispose of their marginal properties, they may fall into the hands of operators who do not have the resources to assure their eventual plugging. The lifetime bonding requirement for commercial disposal wells strengthens financial assurance.
6. The permitting system gives the public an opportunity to know of applications for injection wells through notices in local newspapers, to have input into the permitting process, and to receive a response to their concerns. The responsiveness of the Division to legitimate public concern has greatly reduced the need for public hearings on permits.
7. In addition to the Division, injection well permitting is subject to review by the appropriate California Regional

Water Quality Control Board and any local governmental agency having jurisdiction (county environmental or zoning officials). While this may make the process overly cumbersome, it does help to assure that the broadest number of concerns with the operation of such wells are addressed.

8. The Division conducts annual meetings with project operators to review all aspects of their operations. This provides an excellent opportunity for both the well operator and the Division to focus on the project and find and correct deficiencies which might otherwise threaten fresh water and results in many wells having multiple file reviews further strengthening this part of the program.

PERMITTING/FILE REVIEW--OTHER CONSIDERATIONS

1. The Review Team was concerned about whether or not financial responsibility is actually assured for the long term. Except for commercial disposal wells, there is no permanent bond requirement. While major companies may maintain continuous blanket bond coverage, they may sell their wells to other operators who do not need to maintain such a bond. By and large, the individual well bonds required of all operators during drilling and the first six months of operation are not sufficient to cover the cost of plugging at this time. It should be noted that life-of-the-well bonds were tried in California in 1976 but fell victim to the crisis in bonding where it became often impossible to obtain bonds. The program was then discontinued. There is a State fund of from \$250,000 to \$350,000 per year available for its use for plugging of wells for which there are no other resources for plugging and the State may get a lien on any property upon which the State must conduct operations.

Adequate funds may not be available to plug injection wells at the end of their useful lives under the current program unless the financial assurance program is revised.

2. The manual tracking of timely compliance with corrective action requirements could be a problem in larger districts.

CONCLUSIONS

The Review Team has concluded that this area of the program is currently being conducted in a manner that is providing reasonable protection to fresh waters and USDWs. However, the Review Team is not without some long range concerns.

Permitting and file reviews are conducted by qualified personnel utilizing extensive technical, procedural, and human resources in an environment that solicits and is responsive to public input and the concerns of other agencies having water quality and environmental responsibilities. The Review Team found this program area to be highly satisfactory and protective of fresh waters and USDWs.

The concern with financial responsibility expressed above is considered to be long term in nature rather than imminent requiring continued monitoring and study but not necessarily any immediate action.

INSPECTIONS

A. OBJECTIVE: UNDERSTAND HOW FIELD OPERATIONS ARE CONDUCTED AND MANAGED FROM THE STATE OFFICE

All inspections are performed by state employees at the district level. Contractors are never used either as a part of the normal inspection activity nor for special periods of intensive workload. Each inspector is responsible for following through with an operator on correcting deficiencies observed during his or her initial inspection. Evaluation of field personnel work performance is carried out by Associate Engineers and Senior Engineers who accompany them annually on tests and inspections to review and evaluate technique. Central office personnel do not conduct field inspections or participate in evaluation of field performance.

Inspection personnel and activities assignments are divided into two general categories being (1) Field Engineers with a geologic or engineering background who are responsible for witnessing mechanical integrity tests, testing safety equipment, and plugging/abandonment operations and, (2) Oil and Gas Technicians I, II, and III who are responsible for evaluation of surface facilities, surface condition of wells and checking of injection pressures. Oil and Gas Technicians conduct routine inspections and are employed in three of the six district offices. Routine inspections can be generally described as those concerning lease housekeeping and environmental evaluations of fluid management practices and facilities. The Oil and Gas Technicians do not have to have a college degree but training or experience in a related technical or environmental service field is sought at the beginning technician level and required at the advanced levels.

Priorities for the general scope of testing and witnessing of well performance and security are set by each District Deputy. Inspection priorities are based upon UIC regulations and policy manuals, however, district personnel may vary from these in order to handle special district problems or needs. Although areas of inspection responsibility are categorized, overall program coordination is viewed as important. For example, other lease conditions would be observed by an engineer while witnessing an MIT. All MITs on disposal wells and 25 percent of enhanced recovery wells are witnessed. Water disposal wells receive top priority for inspection.

Inspections are performed annually on all other wells with no particular priority unless a violation or deficiency is discovered. In such cases, the lease or well becomes an inspection priority until the district office is satisfied a return to ongoing compliance has been established. Inspectors use a personal notebook to keep a daily journal of observations and these personal notes are used to review problems with supervisory personnel and establish future inspection priorities. A copy of a typical log book page was provided the reviewers at the District office in Woodland.

In addition there are standard forms for conducting and recording

routine inspections. In addition to the annual inspection, wells receive a Division inspection during each MIT and again during the annual environmental lease inspection.

The California inspection program has a well developed communication system which keeps the field personnel in regular contact with the district office staff. Any verbal communication on emergency matters is followed by written communication and appropriate documentation. Districts are required to submit quarterly reports of operations to headquarters and data from these reports are compiled into the Class II UIC report to EPA. Field inspectors are equipped with radios and pagers and are on 24 hour call. There is an arrangement in each district office for after hours and weekend contacts. California has a spill contingency plan and the UIC program manager in Sacramento is a member of this state committee which coordinates interagency activities on spills. The Division is in charge of all spills in producing areas.

Enforcement actions are handled by the District Deputy and involve the issuance of deficiency notices, notices of violation, and formal orders. Field inspectors and their supervisors are responsible for gathering all information on a case and presenting it to the District Deputy. The Attorney General's staff representative assigned to the Division may go to the field office when special legal assistance is needed.

Significant training opportunities are provided for inspectors utilizing staff engineers, industry and service company personnel, college courses, EPA sponsored training courses, etc., in technical areas related to their job, safety, internal policy and procedures, chain of custody procedures and more. Training periods for new field personnel varies depending on the complexity of the district inspection needs and the trainee's ability to learn. The central office staff approves and monitors district training plans to assure uniformity. New inspectors are evaluated three times in their first year and performance is appraised yearly thereafter. Inspectors are provided safety equipment for field work.

**B. OBJECTIVE: UNDERSTAND THE ROUTINE/PERIODIC INSPECTIONS
PERFORMED IN THE STATE**

The district offices conduct both routine and periodic inspections on wells and lease facilities. Inspectors use both an Environmental Inspection Form and an Injection Form to record observed conditions. The amount of time absorbed in a single inspection ranged from 10 to 20 minutes at the well site. Travel time, however, may be as much as two hours. Inspectors do not use a separate checklist, but the previously mentioned forms serve for recording essential information such as the pressure in the annulus or fluid flow rates. District inspectors conduct between 500 and 600 inspections per month. Because of weather, winter inspection rates are about 25% below summer rates. Operators are usually not given advanced notice of routine inspections in order that operating conditions may be observed more nearly as they would normally occur. Unannounced inspections minimize tampering or

preinspection cleanup by the operator. Only in those cases where a pressure gauge needs to be installed for test purposes or a sample of water must be collected from the tank or injection line is the operator contacted in order to have a representative present. Division personnel have the statutory right of ingress and egress from oil leases and have encountered no problem with gaining entry to a lease to conduct inspections. The operator is sent a letter verifying non-compliance following the inspection. Correction of any deficiencies noted is acknowledged in written form to the operator after reinspection of the problems. Photos are taken, when appropriate, and logged.

California has an excellent procedure for sample collection, documentation, preservation and transportation. This procedure follows the Division's EPA approved Quality Assurance Plan. The Division is planning to undertake the preparation of a training video for quality assurance and quality control (QA/QC) for field inspectors. The Division uses both State Department of Health Services and private labs to run analyses on samples. Selection of a particular lab is based on convenience and past record of reliability.

In most cases, the labs are notified prior to a sample collection event. Chain of custody procedures are required of operators collecting samples as well as Division staff. Division personnel are not allowed to handle oil field equipment and, therefore, depend upon gauges and flow meters owned by the company for data. Operators are required to calibrate permanently installed gauges at least every six months and portable gauges every two months. Division engineers inspect operator logs or require calibration witnessed by Division engineers to provide Quality Assurance. The witnessing of gauge calibration provides the quality assurance in those cases where an engineer may be concerned about test data submitted.

C. OBJECTIVE: UNDERSTAND THE EMERGENCY AND CITIZEN COMPLAINT PROCEDURE

As in any oil and gas regulatory program, the Division receives reports of spills, leaks and discharges either through reporting by industry personnel or citizen complaint. Notifications of emergencies generally are directed to the district offices, however, they may also be received through the Department of Health Services or the State Office of Emergency Services. Inter-agency jurisdictional overlap is covered by a Memorandum of Agreement which addresses necessary notification, statutory responsibility, and statutory jurisdiction for enforcement actions.

When a report of an emergency event is received by the District office, the district field engineer completes a detailed emergency report form and an engineer is sent to investigate the problem. The operator of the lease is concurrently contacted. The field engineer stays on site until any required cleanup and repair efforts are well underway. Radios permit the engineer at the site to be in touch with the district office as may be needed during the investigation and cleanup. Each district office has procedures for

back-up and an established rotation schedule to assure 24 hour coverage of emergencies. The field engineer fills out a report based on on-site observation and activity. This report is not finalized and filed until the incident is over and the cleanup is complete.

All complaints are investigated with priority given to those cases involving risk to humans, wildlife or drinking water. Each district will prioritize investigation of complaints on the basis of threat potential, however, there appears to be no specific deadline established, statutory or otherwise, on the length of time which might elapse between filing of a complaint and field response by district personnel. The district always notifies the operator as soon as possible so that complaint resolution can be initiated. District personnel do try to investigate most complaints within 24 hours. Citizens are advised either by telephone or letter of the results of a complaint notification, however, actual complaint investigation reports are not, as a general rule, sent to citizen complainants. Neither the Division nor the State of California becomes involved in private problems between landowners and operators and these matters are left for civil court resolution. The Division encourages operators to negotiate with each other on points of disagreement on interlease matters and generally does not hold hearings unless production zones have been allegedly flooded out. The California program has not encountered any injection well contamination cases and therefore, court testing of procedures or statutory authority has not occurred.

D. OBJECTIVE: UNDERSTAND THE OUTPUT FROM FIELD INSPECTIONS

All inspections are logged in a daily journal in the district office. The journal entry for each incident summarizes the type of notification and results of investigation. In addition, findings are documented on an inspection form and placed in the well file. Different type inspections are recorded on different standard forms and field notes are incorporated into the inspection form and well file.

Supervising UIC engineers monitor the inspection reports for program compliance and for inspector conformance with procedures and policy. The District office files are fairly well systemized as to subject (injection well project, environmental or well file) and cross filing is done where appropriate. Inspection results are written up within 24 hours. Report review by the engineer is generally completed within one week after the inspection. Sample collection procedures have been developed to meet Division legal enforcement needs. Though the State Counsel has not specifically reviewed the forms or inspection procedures for legality, the Attorney General's representative assigned to oil and gas matters may attend the tri-yearly management meetings where standard forms and procedures for field inspections are reviewed with district deputies and headquarters management staff. A proposal is in the mill to have all inspectors and Associate Engineers take a course on proper procedures for legal testimony.

INSPECTIONS PROGRAM--STRENGTHS

1. All inspectors are employees of the Division. They work out of district offices and report daily to their supervisors. This arrangement provides a great deal of control over and feedback from the field operations.
2. The inspection program is well thought out and provides the field personnel with the resources to do a good job. Those inspections requiring the interpretation of data such as MITs are done by those with the most education, expertise and training. The inspectors have all permit and well data available to them in their respective offices. The inspection vehicles are radio equipped to provide direct communication with the district office. This facilitates the prompt reporting of problems found in the field and the rapid redeployment of field personnel based upon unforeseen needs or circumstances. Inspectors are provided with pagers and there is an "on-call" system in operation to assure that emergency conditions can be addressed. Inspectors seem to be provided with an extraordinary number of training opportunities including training in proper sampling" and chain of custody procedures. Inspectors are provided with appropriate safety equipment.
3. Each district appears to have a well conceived plan for work load priority. Priorities are driven by the program rules, the Division's Manual of Instructions, close monitoring of commercial disposal wells and problem operators and response to emergencies and complaints. Response to emergencies and citizen complaints is very prompt (immediate for emergencies and generally within 24 hours for complaints). The response is documented.
4. Photos are taken of all new injection wells to provide a base line for future inspections.
5. There are a variety of comprehensive standard inspection report forms and documentation of field activities is very good. Accountability to the main office is enhanced by the completion and submittal of quarterly reports. Review of field activities by the district engineering staff is prompt.
6. A percentage of unannounced inspections and conformance with an approved quality assurance program greatly enhance the reliability of the program output from field activities.

INSPECTIONS--OTHER CONSIDERATIONS

1. There appeared to be no interim report process for those incidents which require a longer cleanup time. Management might wish to consider requiring interim reports to assure itself that cleanup is proceeding in an appropriate and timely manner.
2. While emergency and citizen complaint response time is reportedly very prompt (within 24 hours), there appears to be no established internal time limit for responses to the various categories of emergencies and complaints. Consideration might be given to formalizing time limits for response to provide guidance and priorities for field personnel and a yardstick against which district response to emergencies and complaints may be measured.

CONCLUSIONS

The Review Team concludes that this area of the program is currently being conducted in a manner that is providing a very good to excellent degree of protection to fresh waters and USDWs. The concerns listed are considered relatively minor in nature.

As can be seen from the "Strengths" listed above, the Division's inspection program is very strong. Inspection strategies and deployment of the various levels of qualified personnel are logical and appropriate, inspectors are provided the tools and training to do an effective job and the documentation forms and procedures are far more than adequate.

The "Other Considerations" listed should be thought of as recommendations for embellishments of a sound program.

MECHANICAL INTEGRITY TESTING

A. OBJECTIVE: UNDERSTAND THE TYPES OF MECHANICAL INTEGRITY TESTS PERFORMED

The Division relies on a combination of radioactive tracer surveys (RAT), temperature surveys, and spinner surveys to determine both significant leaks or fluid movement. Two of these three methods must be used for each well tested except in the Long Beach District which requires all three. Pressure tests are used rarely, typically between RAT surveys when a workover is performed. The pass/fail criteria for RAT surveys are that 100 percent of the injection fluid must be exiting through the perforations and that no fluid can be moving up the wellbore. Guidelines for running RAT surveys have been established and service companies provide training and advice. All MIT logs are reviewed by the UIC engineer.

RAT surveys determine fluid movement up the tubing-casing annulus and/or fluid movement above the injection zone. If a failure is detected, a well is required to be repaired before operation can continue. Except in the case of a tubing or packer leak the RAT survey does not determine casing leaks above the packer and casing leaks, if they exist, may not have to be repaired. Leaking packers were indicated to be the most common cause of mechanical integrity failures.

Annulus pressure monitoring, is not used for determining mechanical integrity. However, the Division does use injection pressure readings from monthly reports as an indicator of well performance problems. Additionally, field inspectors observe gauge pressures wherever gauges are in place. Monthly injection reports are checked for compliance with injection pressure limitation requirements. Whenever requests are made by the district office, computer runs are made to identify wells with excessive injection pressure.

B. OBJECTIVE: UNDERSTAND THE IMPLEMENTATION OF MIT

MITs are scheduled for once a year. There is variation between the districts in the actual processes used in operator notification of test scheduling, however, automated methods are used to determine which wells are due tests. The Bakersfield district also notifies service companies of wells to be tested by providing a list from which they will notify operators. Operators can request a schedule change. Because of lack of resources in the Bakersfield district, 18 months may pass between tests. While not all MI tests are witnessed by a Division inspector, disposal wells, particularly commercial wells, receive priority. Computer tracking is used to determine delinquent tests.

C. OBJECTIVE: UNDERSTAND THE PROCEDURES OF WITNESSING A MECHANICAL INTEGRITY TEST

District field engineers witness MITs and assure that test guidelines are met. Anomalies observed during the tests can, therefore, be observed firsthand. If a failure is witnessed, the engineer can order the well to be shut-in.

This action is followed by a letter and a visit to assure compliance. The scheduling is automated and the notice to operators appears efficient, especially when the service companies are provided schedules. Witnessing of tests by engineers rather than technicians is a strong link in the MIT program, especially since log certification is not required.

Monthly injection report data is automated and allows computer generated lists of excessive injection pressure and other data which can be readily evaluated for indications of injection problems.

MECHANICAL INTEGRITY TESTING---STRENGTHS

1. The frequency of testing (annual) provides an excellent opportunity to detect failures before they have a chance to threaten protected waters. Even considering that the largest district is unable to test its wells more often than every 18 months the schedule is substantially more frequent than the five year schedule set out in the EPA rules.
2. California relies on the radioactive tracer survey in combination with a temperature or spinner survey as the means to demonstrate MI. This test is commonly conducted by a third party (a commercial logging company). Rigid test guidelines are in place.
3. The detection of any fluid not entering the injection zone or vertical movement behind pipe is considered a failure requiring repair or discontinuance of use.
4. The district offices maintain the annual MI test schedule on computer and can easily find and follow up on test reports not submitted as required.

MECHANICAL INTEGRITY TESTING---OTHER CONSIDERATIONS

1. Other than an initial pressure test, the Division's test procedures do not generally include a separate pressure test to determine the integrity of the casing above the packer (the leak portion of MI).

2. It was understood that even if a casing leak were known to exist above the packer that such leak would not necessarily be required to be repaired if the well otherwise passed the tracer survey and temperature survey portion of the test and it is known that the injected fluids are confined to the intended zone of injection. Any failure in the production casing of an injection well should be repaired within a reasonable time after discovery both to assure that such failure does not serve as an avenue for out-of-zone movement of injected fluid and as a potential mechanical problem which might complicate plugging operations.

3. Wells failing to demonstrate MI can be shut in for at least a year and sometimes longer without repairs being made. It was not clear to the Review Team that any evaluation was done on such wells to identify those which might be a threat to fresh water or USDWs and to require immediate repair of such wells rather than simply requiring a shut-in.

Consideration should be given to a rule or policy which would limit the time that a well without MI could be shut in.

CONCLUSIONS

Although California does not run a separate pressure test, the Review Team concludes that the overall frequency of testing, the reliance on the mechanical logs used, the staffing and administrative and technical procedures used all work to provide superior protection from well failures.

Without further study, the only concern identified by the Review Team in this area that may need change is the treatment of wells failing mechanical integrity and then shut in. It is felt that there must be some reasonable time limit in which such wells must be repaired or plugged in order to assure that they do not threaten fresh waters or USDWs.

COMPLIANCE/ENFORCEMENT

A. OBJECTIVE: UNDERSTAND ENFORCEMENT PROCEDURES IN THE STATE

Orders are issued to abandon or repair wells, adopt, plans for subsidence control or assure protection of wildlife, health and ground water quality. Such orders are issued by the District Deputy Supervisor after approval by the State Oil and Gas Supervisor. Orders can be appealed to the Director within 10 days of issuance and usually prescribe a 30 day period from the date of issuance for the corrective work to be completed. The Division has the authority to do the work, place a lien on the property and impose penalties in those cases where the responsible operator either refuses or is unable to comply with the provisions of the order. The order is terminated upon completion of the work or upon successful appeal to the Director by the operator. Formal enforcement actions in the form of orders have been issued rescinding permits, shutting in wells and forcing repair of wells.

Civil penalties have been issued for failure to file records or notify the district office of work being done, unauthorized injection of

fluids or change of fluid stream without prior notification. Penalties may be issued for failure to comply and may range from \$100 to \$1000 per offense at the misdemeanor level. Additionally, a civil penalty not to exceed \$5000 for each day of violation may be imposed.

An appeal to an enforcement order can be filed by the operator, surety or landowner with the Supervisor or District Deputy. Appeal is made before the Director of the Department of Conservation in a public hearing and the Director's judgment is final. If no written decision is made by the Director, the Supervisor's order is considered final.

Further appeal may be made through Superior Court. Civil penalties issued by the State Oil and Gas Supervisor are also subject to appeal to the Director and the court. UIC staff involvement in the appeal process is limited to case and fact sheet preparation and as presenters of hearing testimony.

The California system of penalties and enforcement order processing appears to work well to ensure permit compliance. The administrative process for penalty issuance is standardized and the operator has a proper legal route through the courts to address dissatisfaction with the Division action. The initial step in the California enforcement action process lies with the field engineer who has been trained in the regulatory and legal aspects of the program. The field engineer makes an evaluation of a field non-compliance event and makes recommendations to the UIC engineer who reports to the Deputy. The EPA definition of significant non-compliance is used to determine the level of violation. The Division considers endangerment to occur when there exists a threat of contamination or degradation of a USDW by a fluid of worse quality. The determination of endangerment is based on the discovery of a physical mechanism, such as a casing leak, wherein a conduit for the entry of the "contaminating" fluid into the USDW is provided.

As previously mentioned, District UIC staff is responsible for gathering and preparing the information for inclusion in any formal enforcement order including all records and chronologies pertinent to the case. The District Deputy prepares a "fact sheet" containing the details and prepares an order. A copy of both documents is forwarded to the Supervisor for review prior to issuance at the District level. Drafting of documents is done by the District staff under the supervision of the District Deputy or Senior Engineer. Subsequently, the State Oil and Gas Supervisor and the Attorney General's Office reviews the orders. The orders actually go to Sacramento and are forwarded to the Attorney General's staff assigned to the Division who works in Los Angeles. Subsequent to this review, the District Deputy issues the formal enforcement order. Failure to comply with an order may result in any or all the following: closure of the well or lease; performance of the work by the Division; seizure of any available bond monies; civil penalties; and/or criminal penalties. If the bond is insufficient in amount for the Division to do the work on a non-compliance case, a lien is placed on the property.

The Division of Oil and Gas has a reasonable and normal coordinating

relationship with other State and Local agencies including the State Water Resources Control Board (reporting of spill events) and the EPA where Federal influence would be useful in achieving timely and appropriate compliance. The Department of Health Services is contacted and becomes involved when a radioactive tool is lost in a hole.

The Division personnel involved in this review felt the Division had adequate field staff and presence to effectively handle compliance and enforcement issues, however, they felt additional staff could be used to witness MITs. Penalties have been issued for a variety of reporting and permit violations rather than contamination events which were reported to be few in number.

COMPLIANCE AND ENFORCEMENT--STRENGTHS

1. The California Class II enforcement and compliance program is somewhat different in structure than found in many oil and gas regulatory agencies. Formal enforcement actions and orders including civil and criminal penalties begin at and are ultimately issued from the district offices. The enforcement actions and orders are prepared by district personnel or deputies (technical personnel) and are subject to review and approval of the State Oil and Gas Supervisor and the assigned Assistant Attorney General prior to issuance. This authority for enforcement actions and to issue fines without lengthy hearings or formal court action should speed and simplify the entire process making it more of a real threat for use against violators thereby encouraging compliance.

2. The Division uses a staged enforcement approach wherein voluntary compliance is sought first. This is followed by use of its more severe enforcement tools if compliance is not initially achieved. The Division generally achieves compliance without resorting to formal enforcement actions. This staged approach is properly and beneficially useful of Division staff time and resources while being protective of USDWs.

3. The internal review procedures and the appeal provisions provided to the Division Supervisor and to the courts serve to assure that no person in the Division may use the compliance and enforcement procedures in a capricious or arbitrary manner.

4. The Division has not had to address any cases involving aquifer contamination. This fact may reflect upon the overall effectiveness of the compliance program.

COMPLIANCE AND ENFORCEMENT--OTHER CONSIDERATIONS

1. The Review Team had no further considerations with this program area.

CONCLUSIONS

It is the Review Team's belief that the Division's compliance and enforcement policies and procedures are sufficient and are being carried out in a manner "that can assure compliance with program rules and permit requirements. As this is the purpose of a compliance and enforcement program, the Review Team concludes that this area of the Division's Class II program provides good protection to fresh waters

and USDWs.

PLUGGING AND ABANDONMENT

AS this section of the report is relatively short, the OBJECTIVES have been combined into a single section.

A. & B. OBJECTIVES: UNDERSTANDING AND DOCUMENTING THE TECHNICAL ASPECTS OF P & A and UNDERSTANDING NON- TECHNICAL ASPECTS OF P & A AND HOW THIS ACTIVITY IS INTEGRATED WITH THE REMAINDER OF THE PROGRAM

A plugging plan is not required as a part of the original permit application and approval process. However, all plugging is performed only after submittal by the operator and review and approval by the Division of a complete detailed plugging proposal. In general, plugging requirements demand cement plugs to be placed across specified intervals to protect oil and gas zones, to prevent degradation of usable waters, to protect surface conditions, and for public health and safety purposes. Drilling mud, of a weight sufficient to prevent movement of other fluids into the wellbore, is required between plugs. Essentially all placement of plugs is through tubing though cement may be placed with a bailer at depths less than 3000 feet and surface cement pours may be approved. Approval of the use of either of these latter two plugging methods is rare and site specific. One hundred foot cement plugs are normally required at the base and top of oil and gas zones (open hole) or above the perforations in cased holes. Cement plugs are required to isolate fresh water zones. In uncased holes this will consist of a single 200 foot cement plug set opposite the base of fresh water strata, in holes cased and cemented throughout this interval a single 100 foot cement plug is required inside casing. Shooting, perforating and squeeze cementing may be required as needed to protect the base of fresh water. Casing stubs and shoes are generally covered with a 100 foot plug. A 25 foot cement plug is required at the surface.

The Division may witness the placement or tagging of plugs in any well. Division inspectors routinely witness the plugging of all wells ordered plugged and the placement and tagging of plugs set at the base of fresh water, the injection interval plugs, any shots or required perforation and squeezes, and the placement of mud. Essentially every well is inspected at some time during the plugging process. This includes the witnessing of from 75 to 80 percent of the placement and tagging of plugs in the injection zone and at the base of fresh water.

A final report of plugging is required from the operator within 60 days following the actual plugging operation. This highly detailed report is examined by Division engineers prior to approval. Verification of information from unwitnessed pluggings may be required. Plugged wells are integrated into the Divisions data system and are reported to the EPA quarterly.

California has a program which provides for injection wells to be placed on idle status or temporarily shut-in. This idle well program allows an operator the flexibility to inactivate a well for a period of time and then reactivate it without a paperwork burden. Wells may be placed on idle well status (temporarily abandoned) for two years without notice to or action by the Division. Idle wells may be identified by the Division from the monthly production reports as the injection volumes reported would be zero.

Each May an idle well list is generated from the production reports and District field personnel inspect those facilities. Operators are provided a list of their idle (temporarily abandoned) wells each year and are asked to submit plans for each well. If the operator has future plans for the well the State will monitor fluid levels and order MITs if appropriate. Each well on the idle well list is evaluated by the District Associate Engineer and District field staff to determine whether further actions should be taken to permanently plug and abandon the well.

PLUGGING AND ABANDONMENT---STRENGTHS

1. The California approach to plugging is solid and workman-like. Plugs are set in such a manner as to reasonably preclude fluid entry into the wellbore from the injection interval or the movement to fresh water zones.
2. Inspectors place most of their emphasis on witnessing the placement and tagging of those plugs providing the greatest separation of the injection zone from fresh water.
3. The percentage of plugging operations actually witnessed (75% to 80%) is quite high.

PLUGGING AND ABANDONMENT----OTHER CONSIDERATIONS

1. California rules permit the use of surface cement pours and setting of plugs with a bailer to depths of 3000 feet. Even though assurances were made that essentially all plugging is now actually done through tubing, consideration might be given to amending the rules or statutes to conform to actual practice. However, it is recognized that such an amendment is not necessary in order to carry out proper well plugging.
2. While fresh water intervals are adequately addressed in the plugging statutes, USDWs are not similarly spoken of directly. The Review Team would be more comfortable if California's plugging statutes also specifically addressed protection of USDWs. Nevertheless, it is recognized that statute as comprehensive as California's in this area gives the Division broad authority to direct well plugging and to call for site or well specific plugs. Plugging procedures such as California's which are designed to keep injected fluid in the injection interval are protective of USDWs.
3. A concern with regard to the idle well program has previously been discussed in the General Program Comments and Observations section of this report.

CONCLUSIONS

Plugging and abandonment as practiced by the Division is designed to be protective of USDWs. The Division has the statutory authority to

require and the expert staff necessary to review and approve proper plugging programs for Class II injection wells and is providing a high level of inspections of actual plugging operations. While the Review Team would like to see USDWs more clearly addressed in the statutes, this is not necessary for proper plugging of wells.

INVENTORY/DATA MANAGEMENT

A. OBJECTIVE: UNDERSTAND THE PROPER USE OF DATA

The Division had an existing preprimacy data processing system that has been modified to incorporate data necessary for the Class II UIC program. The system contains computerized data on all injection wells including well identification, well use, type of fluid injected, current status, injected volume and pressure, days of operation, source of injected fluid, and the reason for shut in if not injecting. The data is derived from the Division's internal records and monthly reports from the operators. The Division has clear reporting instruction manuals which are supplied to well operators.

The system is used for the preparation of required quarterly reporting to the EPA and for public information.

Additionally, the system serves as a management tool as in the determination of wells injecting at pressures in excess of that authorized or wells inactive longer than permitted.

Printouts of such wells are supplied the district offices for their use in corrective and/or enforcement action.

There are five full time employees in the data processing section in Sacramento. The section has an annual budget of about 1.5 million dollars about 10 percent of which is attributed to the UIC program. In addition to the mainframe computer in Sacramento, each district office is supplied with one or more personal computers which, as noted in other sections of this report, are used extensively in tracking various aspects of the program at that level.

INVENTORY/DATA MANAGEMENT - STRENGTHS

1. The Division has a sophisticated and mature data processing system that is being used both for data and program management.
2. The excellent reporting instruction manuals available for operators should help assure the quality of the data received.
3. The availability of computers at the district office level provides them with a good management tool.

INVENTORY/DATA MANAGEMENT--OTHER CONSIDERATIONS

The Review Team identified no specific concerns with the Division's data management system or procedures.

CONCLUSIONS

The Division has and appropriately utilizes both main frame and personal computers to manage data and as a program management tool. The systems used by the Division enhance its ability to protect fresh waters and USDWs.

PUBLIC OUTREACH

OBJECTIVE: UNDERSTAND HOW THE STATE USES PUBLIC OUTREACH

The public is notified of all proposed Class II injection well permits. This notification is addressed in the Permitting and File Review section of this report. Copies of the UIC laws and regulations are available for public inspection and use at all Division district offices and most public libraries. Local governments and operators are notified of UIC policy changes or additions by written notice. New operators receive copies of appropriate UIC requirements upon filing any application for an injection permit. Whenever there is a change in UIC policy, operators receive written notice. Mailing lists of operators, local governments, and interested groups are maintained. Local agencies have been interested in a number of UIC issues but primarily commercial disposal wells where water is to be trucked.

The Division has prepared an excellent pamphlet entitled "Class II Injection Well Facts" and a corresponding video tape for public education and information. These modes of public outreach are designed to give the citizen an overview of the scope and nature of injection wells and injection operations in the State inclusive of their purpose, construction, operation and the regulatory processes which apply to such wells. The video tape and pamphlet have been widely distributed to groups including a number of major oil companies, the Western Oil and Gas Association, the California Independent Petroleum Association, EPA, DOE, BLM, AAPG, IOCC, UIPC, County Supervisors and 5 to 8 County Boards of Supervisors, a number of citizen groups, and eight major cable television systems. Copies of the video and pamphlet are maintained at each district office where they are shared with local interest groups. Copies of the pamphlet have been distributed to major State libraries.

PUBLIC OUTREACH--STRENGTHS

1. The Division has established a public outreach program designed to inform interested citizens about the program as a whole and also to alert them about applications for injection wells or injection well modifications in their areas.
2. The Division's educational video tape and pamphlet for the Class II program are excellent examples of clear and concise public educational and informational material.

PUBLIC OUTREACH--OTHER CONSIDERATIONS

The Review Team had no concerns with this program area.

CONCLUSIONS

The Division has established an effective public outreach program. They have been aggressive in getting their program video tape and pamphlet out to the affected industry, county and local governments, and the general public. The Division staff continually prepares numerous other publications as a part of their public outreach effort.

Public notice and routine intergovernmental review of UIC applications

should assure that the reasonable concerns of the public are heard. Indeed, the smoothness with which the Division's program operates in a State with a reputation for perhaps extraordinary environmental concern may well be a testament to the effectiveness of their public outreach program. The Review Team believes that the Division has created an excellent outreach program that is both effective and reasonably focused.

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APPENDIX III

Glossary of Acronyms

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GLOSSARY OF ACRONYMS

APCD	Air Pollution Control District
API	American Petroleum Institute
BLM	Bureau of Land Management
Cal-EPA	California Environmental Protection Agency
CARB	California Air Resources Board
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CIPA	California Independent Petroleum Association
DHS	Department of Health Services
DOC	Department of Conservation
DOGGR	Division of Oil, Gas, and Geothermal Resources
DTSC	Department of Toxic Substances Control
E&P	Exploration and production
EOR	Enhanced oil recovery
EPA	United States Environmental Protection Agency
F&G	Department of Fish and Game
GPS	Global positioning system
GWPC	Ground Water Protection Council
H ₂ S	Hydrogen sulfide
IOGCC	Interstate Oil and Gas Compact Commission
IOPA	Independent Oil Producers Agency
IWMB	California Integrated Waste Management Board
LEA	Local Enforcement Agency
MIT	Mechanical integrity test
MOA	Memorandum of agreement
MOI	Manual of Instructions
MOU	Memorandum of understanding
NORM	Naturally occurring radioactive material
OES	Office of Emergency Services

P&A	Plug and abandon
ppm	Parts per million
PRC	Public Resources Code
PSD	County Fire Department Protective Services Division
RA (RTS)	Radioactive tracer survey
RWQCB	Regional Water Quality Control Board
STLC	State toxic level of contamination
STRONGER	State Review of Oil and Natural Gas Environmental Regulations
SWRCB	State Water Resources Control Board
TCLP	EPA's toxicity characteristic leaching procedure
TPH	Total petroleum hydrocarbons
UIC	Underground Injection Control
UIPC	Underground Injection Practices Council
USDW	Underground source of drinking water
USF&WS	United States Fish and Wildlife Service
WDR	Waste discharge requirements
WSPA	Western States Petroleum Association